

# *The* **BROADCASTER**



NEWSLETTER OF THE BROADCASTING DIRECTORATE

No. 10

March 1988



TWILIGHT

## 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:

The Editor  
The Broadcaster  
Telecom Australia  
GPO Box 1621 ADELAIDE SA 5001

*Editor:* Jack Ross

*Publication Co-ordinator:* Mel Pressley

*Design and Layout:* Brian Turner

*Secretary:* Jan Shirra

*Co-ordinators:*

Central Office: John Hodgson,  
Bill Edwards,  
Bill Morrisey  
Queensland: Doug Sanderson  
New South Wales: Ron Johnson  
Victoria: Ray Weeks  
Tasmania: Glen Clements  
South Australia/NT: Jerome van der Linden  
Western Australia: Kevin Buckland

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## Editorial

Since my retirement I have had opportunity to spend time listening to various radio programs which in the past did not have much appeal to me.

I have been impressed by the large amount of time now being devoted to historical matters by both national and commercial stations. Perhaps the Bicentennial Celebrations have something to do with it.

Even broadcasting history has had a fair share of the program time. People are talking about the contributions of well known people like Marconi, Armstrong and Tesla and also Australian pioneers including Ernest Fisk of A.W.A., Sir Harry Brown and Frank O'Grady of the Post Office, Ray Allsop of 2BL and Raycophone, Ted Gold of 4GR/4ZR, Len Schultz of 2GB and many others.

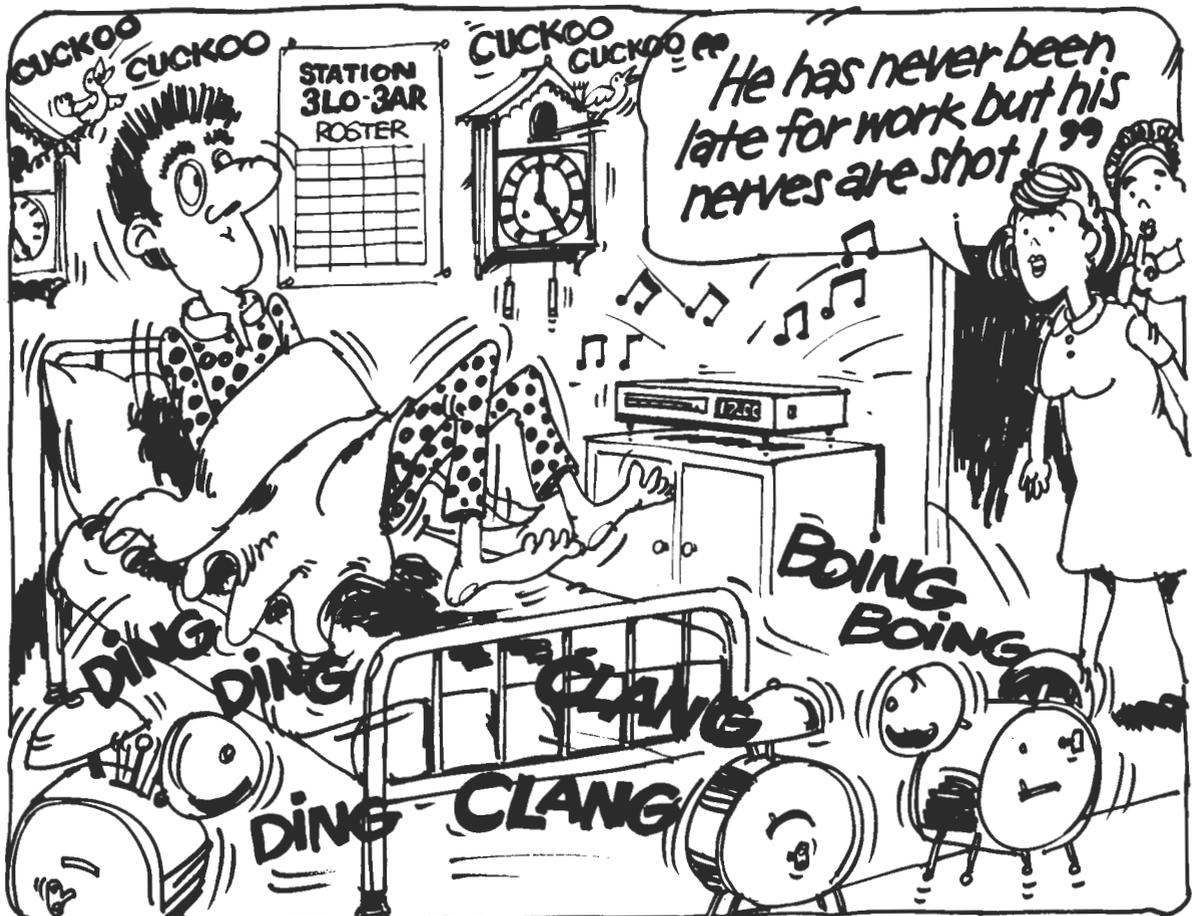
This is indeed a good sign as these were technical people - the people who made broadcasting possible - and not the celebrities, the announcers and the quiz masters who figure so prominently in most books written about broadcasting. For too long the emphasis has been placed on people behind the microphone at the expense of those who worked in the back room developing and operating the technical facilities. It seems the historian has at last recognised that the role played by the technical people is just as important in the history of broadcasting as that played by those whose names became household words because of the technology.

JACK ROSS  
*Editor.*

*Front cover:*  
5CL/SAN Pimpala radiator.

*Contributors to this issue:*

Leon Sebire	Alex Hanlon	Edmond Davies
Chris Dobson	Steve Hoile	Murray Fopp
John Hodgson	Ken Moore	Ted McGrath
Geoff Beetham	Doug Brooke	Jack Ross
Ray King	Keith Synnott	Rai Beelitz
Doug Sanderson	Ray Weeks	Kevin Buckland
Barry Smith	Brian Hall	John Paul



### ABRQ-3 MT HOPEFUL

National Television Service transmitting station ABRQ-3 is located on Mt Hopeful about 70 km by road south of Rockhampton. The city is situated on the Tropic of Capricorn and is the chief commercial and government centre of central Queensland. Rockhampton is the outlet for the produce of a rich cattle area and is frequently called 'the beef capital of Australia'.

The station began transmission on 21st December 1963 using programs originating from the studios of the Australian Broadcasting Commission in Rockhampton. Later, when the Seacom radiocommunication broadband link became available programs were provided from the Toowong Studios in Brisbane. In 1986 programs were provided via the AUSSAT satellite.

Commercial station RTQ7 originally shared the building with the transmitters being maintained by the ABRQ3 staff. On 30th June 1983 the station began transmission from their own building using new transmitters remotely controlled from studios in Rockhampton.

An NEC 10 kW FM Stereo transmitter was commissioned on 1st October 1981 using an antenna attached to one leg of the main tower. The station is also host to an 1800 channel telephony bearer from Rockhampton to Biloela and several 60 channel systems to Mt Morgan and Wowan.

In January 1988 remote control facilities were installed and this allowed a reduction in staffing level at the station.

Staff who live in Rockhampton have a long travel to work over a road which can sometimes cause problems. The last 20 km of the road is flood prone and staff regularly have to use four wheel drive vehicles to get to and from the station. It is not unusual for staff to be marooned. On one occasion it was a full week before staff could be relieved. A helicopter was used to land at the base of the mountain whose altitude is 610 metres.

BARRY SMITH

### 4SO SOUTHPORT

Station 4SO serves the Gold Coast, a densely populated area in the south-east corner of Queensland. The area covers some 123 square kilometres and extends along about 40 km of coastline from Paradise Point in the north to Coolangatta on the border of Queensland and New South Wales. The area's resorts and natural attractions have established it as one of the world's major tourist spots. The most famous town in the area is Surfers Paradise, famous for its many hotels and high rise units. The first Surfers Paradise Hotel was built by James Cavill in 1925 but the major development has taken place during the last 25 years.

The station was commissioned in October 1952 to provide improved service to the Gold Coast because of high noise level resulting from leakage across salt encrusted power line insulators. It was established on a two hectare site which at the time was reasonably isolated but is now part of a select housing area with the land being said to be worth \$3 million.

The original pair of 200 watt Philips transmitters are still in service operating on 1593 kHz and feeding a 33 m radiator. As expected at a site so close to the surf, salt is a problem with the facilities. The radiator guy wires had to be replaced within three years of erection, and although the transmitter cubicles are a little rusty in places, they have weathered 33 years of operation in this aggressive environment reasonably well.

Although the service area is limited, the population density in the vicinity is very high and the station has provided an exceptionally good service to the thousands of holiday makers sunbaking throughout the year from Lands End to Tweed Heads. Until it was joined by a local commercial station in 1967, 4SO was the only station providing a good signal into the area.

DOUG SANDERSON.



Leon Sebire

## From the Director's Desk

The last issue of *The Broadcaster* mentioned the then impending retirement of our colleague Jack Ross, State Broadcasting Manager SA/NT and honorary Editor of our newsletter. I am now able to advise with pleasure that despite "retirement" Jack has consented to becoming contractually engaged to the Directorate as on-going Editor for the time being. This issue is the first produced under the new regime and I am sure all readers will support the arrangements we have made.

The editorial task will be more onerous as Jack's access to facilities and individual staff members becomes more tenuous. I therefore implore all staff to give the supply of newsworthy contributions and responses to requests for information high priority to enable him to meet the targets we have set for him.

The circle of readership of *The Broadcaster* continues to increase as evidenced by requests for additional information on topics reported in our pages. Many of these requests arrive from overseas and from people in technical areas facing similar problems to those we are progressively solving. The format of *The Broadcaster* dictates that we publish only summaries of projects and specific initiatives.

I would ask that staff members when preparing technical articles for inclusion also give thought to the preparation of detailed articles suitable for submission for presentation in the more specialised journals of our industry both at home and abroad. I will at all times be happy to receive suggested papers to be passed on to the many publishers and bodies seeking contributions. From personal experience I can assure potential writers of technical items of interest that the benefits of publication in a prestigious journal far outweigh the tedium of preparing the article.

LEON SEBIRE

## News Round Up

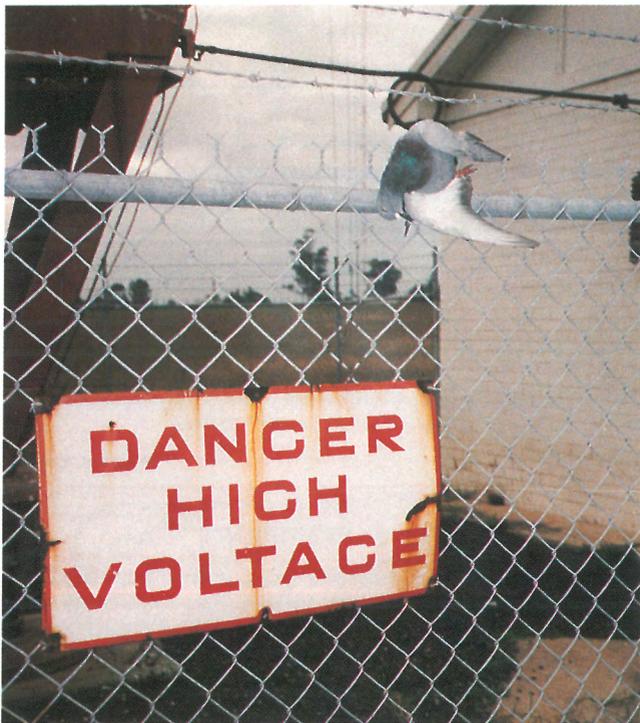
### PIGEON COULD NOT READ

Broadcasting masts and towers are popular places for birds to perch and to nest. Hawks and sea eagles have been known to build massive nests comprising not only grass and twigs but even large branches up to 15mm diameter, jam tins, beer cans, fencing wire, pieces of plastic and in one instance, a tricycle tyre.

Frequently the nest doesn't affect the transmission but when it is built inside the sectionalising coil of an m.f. radiator or across the dipole element of a television antenna panel, service can be interrupted. At one station the nest inside a sectionalising coil caught fire and the bird was lucky to escape but it probably had a few feathers singed in making a quick exit.

The luckless pigeon shown in the photograph impaled on the fence surrounding the 2FC/2BL radiator apparently did not or could not read the sign.

ALEX HANLON



*End of the pigeon.*

### NEW ADMIN/DEPOT BUILDING, PERTH

On 15 October 1987, Director Leon Sebire officially opened the new Western Australia, State Broadcasting Branch, Admin/Depot building in West Perth.

The brief opening ceremony was attended by the Telecom State Manager and Chief Managers, representatives from the ABC, Department of Transport and Communications, Department of Computing and Information Technology, Golden West Network, Commercial Television Stations, Public Broadcasting Stations, Aussat, State Energy Commission, NEC, Department of Local Government and Administrative Services and CBH (the building owners). Following the opening ceremony, Broadcasting Branch staff were able to show the visitors around the building to explain the operations that are carried out.

During the opening ceremony the Director presented to the State Broadcasting Manager Don Purdy a letter he had received from the Deputy Premier of WA and the Minister for Communications congratulating the Branch on its efforts in relation to the SRRN project in WA.

KEVIN BUCKLAND

### TWO CLOSE SHAVES

During a recent fire detection system upgrade at one of the NSW broadcasting stations, the contractor carrying out the installation advised the station OIC that the system would be inoperative for one night due to a power supply unit delivery problem.

Following discussions between the OIC and the Buildings Officer, it was agreed that the loss of the fire alarm for one night only was an acceptable risk. After all, there had never been a fire at the station during its entire 45 years' operation.

About 5 p.m. that afternoon, as the OIC was making a final security check prior to leaving the station unmanned for the night, he heard loud arcing sounds coming from behind the diesel control cubicle followed by rising black smoke.

Investigations revealed that the sparks and smoke were coming from the cubicle bypass switch which carried the full load of the essential mains supply.

The local County Council electrical staff were called in to isolate the switch to allow it to be taken out for repair.

There was no substitute switch available so it had to be despatched to Melbourne for repairs.

However, there was no cause for panic, after all, the mains supply to the station had had a good record and the emergency diesel generator was unlikely to be required.

The isolate switch was eventually repaired and returned to the station. The mains supply had lived up to its past good record and not one minute of transmission time was lost.

The switch was put back into service, and lo and behold, within hours, the power mains went down. The diesel sprung to life, the bypass switch thumped home, and the transmitter quickly revived after an injection of life giving volts and amps at the right frequency. How lucky can you be?

STEVE HOILE

### HIT BY LIGHTNING

Have you ever had one of those days when everything seems to go right when big trouble occurs? Well, for the NT Broadcasting District, 4th November 1987 was one of those days, except for a couple of seconds around 6.39 a.m.

At that moment in one of the first storms of the wet season, lightning was building up in a massive thundercloud high over Darwin. Leaving the cloud, the lightning blazed across the sky for a direct hit on 8DR, the ABC's Darwin transmitter.

At their homes having breakfast, were Jim Finch SLO1, Terry Wooster A/g ST02, and Dave Edwards A/g T02. All three realised that a 'technical malfunction' had occurred when their radios went dead followed by the crash of thunder. Jim and Terry dashed to the transmitter. Dave Edwards rang Darwin Route Control twenty minutes before staff were due and asked for the 'early bird' to remotely start the Berry Springs Emergency Transmitter. Located 50 km by road from Darwin this NT Emergency Service owned transmitter is a back-up for 8DR primarily in case of cyclone damage.

The Fire Brigade beat both Jim and Terry to the transmitter. Donning breathing apparatus, they found a fire had occurred in the power board. With the ABC back on air at Berry Springs, the next problem was to assess and repair the damage. Terry called the Telepower group in Darwin. Yes, they had people available, but first the smoke had to be pumped out. Fans and a generator were delivered by a hire firm.

A black and smelly team of Telepower and Broadcasting staff had the station back on air less than 12 hours after those disastrous few seconds.

We live with lightning in the Top End. Even NASA came here to study it. We may not be able to repair the damage as quickly as it occurs, but on days like 4th November, when almost everything goes right, we can get it done fairly quickly.

MURRAY FOPP

## Road Blockage

### ACCESS PROBLEM AT MT DOWE

Station ABUN7 which also houses the commercial transmitter NEN9 is located on Mt Dowe in the Tamworth Broadcasting District. It is close to Narrabri, a town of some 7300 residents where the staff live.

Early on the morning of Friday 2nd January 1987, a violent storm passed over Narrabri, waking me before the alarm went off at 5 a.m. Not knowing what was in store on the mountain, I left for work at the normal time, 5.30 a.m.

Once on to the mountain, it was not long before I was above the cloud base and in heavy fog. Rounding one of the many hairpin bends, I was amazed to see what appeared to be a waterfall pounding the side of the road. It was coming from one of the steeper gullies at a point where I had not seen water run in the 19 years of travelling the road.

A few metres further on, a sliding stop pulled me up inches away from a moving landslide blocking the road.

Waiting for the shift TO2 to arrive at the slide in his vehicle, I tried radioing for help on the Telecom Mobile but to no avail. The mobile was off the air. I assumed that the power had failed at Mt Dowe.

With no sign of the TO2 I reversed down the mountain to a point where I turned around and headed back to town at full speed. By now water was everywhere and it was obvious that the TO2 was unable to get through in his vehicle. I arrived back at home at 7 a.m. to find a very agitated wife and son out of bed this early. The 'phone had been ringing since 6.30 with people trying to find me.

Telephone calls were made in quick succession to have the local council send a grader to clear the road, to have power mains repaired, to advise ABC and NEN9 that there would be no transmission until staff could get through, and to recall a Technician.

A quick coffee, a change of clothes, and I was off again with the Technician.

By the time we got to the slide, the waterfall had stopped and the slide was clearly visible, as was a second slide a few hundred metres up the road.

We rolled, shoved, pushed boulders, logs and mud, to allow a path over the first slide. With the OIC on the far side of the landslide, the intrepid Technician drove the 4 wheel drive over the top, the OIC nearly having a heart attack, watching. Same action on the second slide, and now the OIC was game enough to get back in the vehicle.

Arriving at Mt Dowe 8.42 a.m., we started the diesel and had transmitters to air at 8.48 a.m.

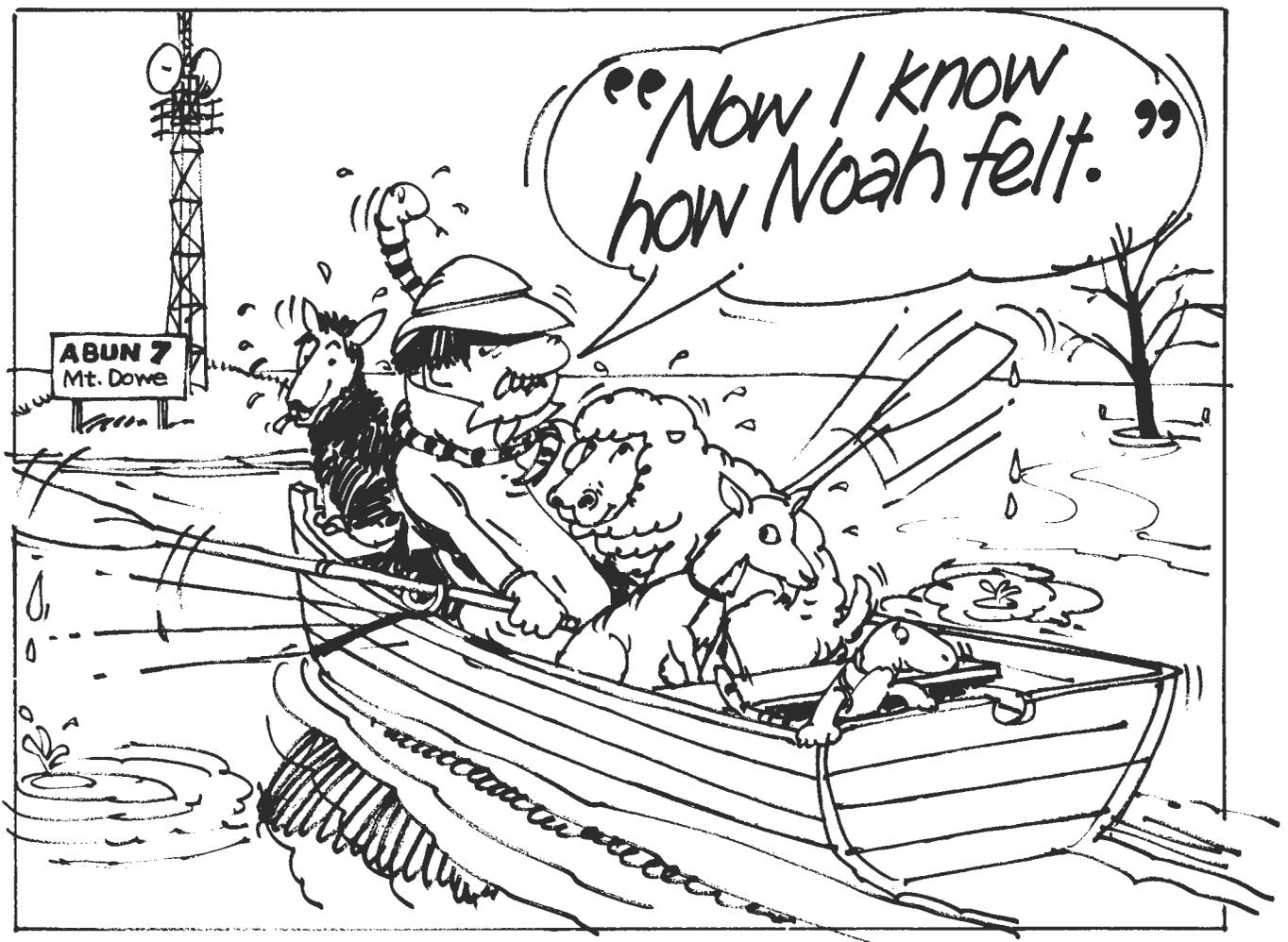
Once settled down, we checked the rain gauge. A total of 175 mm had fallen at Mt Dowe and it looked reasonable dry. How much had fallen in the area of the landslides?

At 9.30 a.m. a 'phone call from the off duty Technician enquiring about our early morning problems, and suggesting that my wife may need a hand to lift furniture upstairs as another storm had hit Narrabri and local flooding was occurring around our homes. Rang the wife, and sure enough water was rising in the garage due to overloaded storm water drains. Son-in-law and Technician arrived and lifted washing machine etc upstairs.

Seven vehicles were written-off after being completely submerged in council parking area.

Narrabri also recorded over 175 mm in a very short period of time. 'A once in fifty years rainfall'.

KEN MOORE



# Serving Rural Australia

## 6BS BUSSELTON—THE DAIRY CENTRE

Station 6BS is located at Busselton in the south western corner of Western Australia. Busselton is some 55km from Bunbury where the ABC local studios are situated.

The station was commissioned on 22 December 1969 using two AWA BTM 2A transmitters operating in parallel on a frequency of 680 kHz and feeding into an antenna that later became the standby radiator. The main radiator was put into service on 27 May 1971. In 1979 the operating frequency was changed to 684 kHz.

The transmitters are operated in an unattended mode with maintenance being carried out by the Broadcasting District staff at Mt Lennard about 33 km east of Bunbury.

The area supports many industries including timber milling and preservation, coal mining, bauxite mining and refining, mineral sand mining and fertiliser manufacture, but the main primary industry is dairying.

The majority of the dairy farms are in the strip from Margaret River to Pinjarra with the advantage of all year round irrigation on some of the properties. The Wellington Dam located 6 km east of the transmitting site is the major water supply source.

The dairy industry in Western Australia is controlled by the Dairy Industry Authority which discharges its responsibilities under legislation by overseeing production control, supervision of milk marketing, promotion, finance and planning and development.

Although the number of dairy farmers throughout the State fell from 3700 in 1965 to about 600 in 1986, milk production in litres/cow showed an increase mainly due to improved management via better breeding, feeding and guaranteed prices

and quotas. Productivity gains by local dairymen exceeded the Australian average and highlights an outstanding on-farm management performance.

Milking is performed twice daily using machines, with the milk being fed into a refrigerated vat which is emptied daily by a refrigerated tanker and taken to a processing plant. Some farmers provide milk for consumption while others provide cream which is used in the manufacture of butter and cheese.

Processing plants such as one at Brunswick Junction, package milk and cream, as well as producing cheese and evaporated milk which is used in the manufacture of ice cream.

RAI BEELITZ and JOHN PAUL



*Making cheese.*



*6BS transmitting station.*



*Unloading milk from tankers.*



*Typical dairy cattle.*

## Pre-Broadcasting Era

### WIRELESS TELEGRAPHY—TASMANIA

Wireless telegraphy experiments were carried out by Post Office staff in Tasmania as early as 1900 but the first noteworthy event was associated with the visit of the Duke and Duchess of York on 3rd July 1901.

The Royal party was aboard RMS Ophir which was escorted by the warships HMS St George and HMS Juno. HMS St George was fitted with a Marconi wireless telegraph installation and successful communication was established between the ship and a shore station at One Tree Point at the Long Beach light known locally as 'Blinking Billy'.

The shore station antenna comprised a Number 14 bare copper wire insulated from a wooden support structure made up of a bush pole 18.2 m long with a top mast of 6 m, making a total height of some 24.2 m.

The receiving and transmitting apparatus were installed in a small room under the light normally used for oil storage. A metal plate immersed in nearby water served as an earth.

The transmitter comprised a 15 cm induction coil with a large spark capacity. A telegraphy key was placed in the primary circuit which was powered by six accumulators.

The detector was an unsealed coherer using soft iron filings resting in the gap between two copper plugs fixed in a glass tub. The hammer of an electric bell was used as a decoherer by rapping lightly on the glass tube. An alternative coherer was available with decohering being effected by slow rotation of the glass tube using a pulley and clockspring mechanism. Signals were printed on paper tape.

Transmissions from the shore station commenced when the warships passed the Derwent lighthouse some 16 km distant. Shortly after the St George came in sight of the light it transmitted "SG" in response to the signals it received from the shore station. Communication was then maintained between ship and shore right up until the ship anchored in the harbour.

The following message was sent and acknowledged:

"Tasmania sends wireless greetings to the Royal Yacht Ophir and escort."

Other messages were exchanged from time to time and recorded on tape. The speed of working was 10 to 12 words per minute.

Arrangements had been made with Lieutenant Trowsdale in charge of the St George wireless installation to make further tests when the ship departed. Unfortunately the St George did not sail with the Ophir. She sailed out at 8 o'clock the following morning and was fully 11 km out of harbour before the shore station staff were able to begin transmissions. A call was sent and answered but the ship was fast steaming out of range and a few minutes later all contact was lost.

People associated with this historic communication included Mr W.P. Hallam Chief Operator Telegraph Department, Mr F.W. Medhurst a Mechanician, and Mr F.P. Bowden Superintendent of Telephones and Telegraphs.

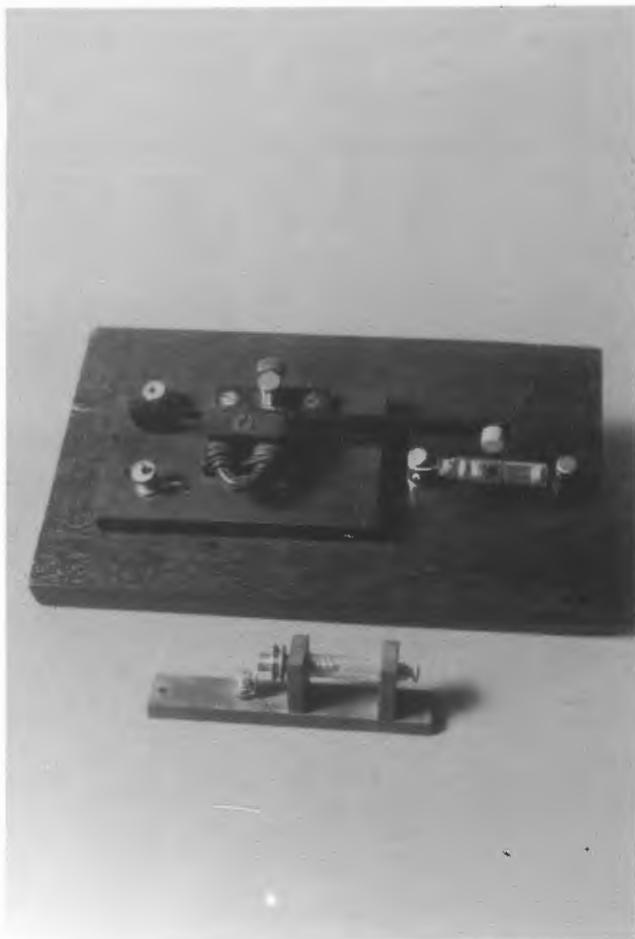
BRIAN HALL



*Transmitting and receiving apparatus.*



*The antenna system.*



*Two coherers. Hammer type (top) and rotating type.*

# Thursday Island

## BROADCASTING AND TV SERVICES

Thursday Island lies in the Torres Strait, about 40 km north of Cape York, and is the location of Australia's most northern broadcasting station. About 2200 people live on the island, which has an area of about 2.5 sq km.

Europeans first settled on Thursday Island in 1877 and although a coastal radio station was put into service in 1913 and is still in operation, the residents had to wait until 1979 before a local National broadcast transmitter was commissioned.

Two STC 1kW transmitters and associated program input equipment were installed and tested in a type 521 telephone exchange type building in Brisbane, and the facilities transported to Cairns by low loader, a distance of 1750 km, and then shipped to Thursday Island, a further 890 km.

Transmissions using call sign 4TI on frequency 1062 kHz commenced on 18 June 1979 using a temporary 32m radiator. Twelve months later a combining unit was installed at the base of the OTC 46m mast and 4TI now shares this mast with OTC.

The station transmits Regional program fed via the Cairns ABC studio. The original feed was an 800 km open wire line to Bamaga on Cape York and thence across Torres Strait to Thursday Island by UHF link. In August 1982 a Cairns-Coen microwave link was installed, and the extension of the system to Thursday Island recently completed.

The residents also enjoy a National television service. A remote area TV installation consisting of a 4.7 m satellite receiving dish, a transmitting antenna tower,, and a small transmitter building are located on Green Hill overlooking the harbour.

Transmissions commenced on 6 December 1981 on Channel 8 with ABC programs being received via Intelsat IV. On 9 December 1985 the service was cut over to the Aussat satellite.

RAY KING



*Customs House.*



*Anglican Church.*



*4TI radiator and transmitter building.*



*Naval gun installed at the turn of the century.*



*Looking towards Prince of Wales Island.*

## Master Control

### RADIO AUSTRALIA SWITCHROOM

The Australian Broadcasting Corporation's Master Control room for the Radio Australia services is located at Burwood East, Melbourne and is a global reception and distribution centre.

Every day the centre sends 50 hours of programs which are broadcast in nine different languages to Asia, Papua New Guinea, the Pacific, and Africa/Indian Ocean. The Middle East, United Kingdom, Europe and North America also receive the Radio Australia transmissions regularly.

Languages which are broadcast include English, Indonesian, Standard Chinese, Cantonese, Tok Pisin, French, Thai, Japanese, and Vietnamese. Around 30 short wave frequencies are employed in broadcasting the programs.

Incoming material is drawn from intrastate, interstate, and overseas sources in compiling the programs which include news and current affairs, topical spoken word features and interviews, and music. The English service broadcasts world news every two hours and regular bulletins of Australian news. In other languages, there are eight news bulletins in Indonesian, three in Standard Chinese, two in Cantonese, two in Tok Pisin, three in French, two in Japanese and one each in Thai and Vietnamese.

A computer-controlled switching system, with a capacity of 40 inputs/outputs, is the core handler of traffic. It is able to feed material into and out of the RA centre, as well as from point-to-point in the building.

Sixteen Aussat lines come into Radio Australia's Master Control, plus terrestrial lines from Melbourne Sound Operations centre and ABC's master control in Melbourne. Twenty lines are available to serve RA's transmitters at Shepparton, Carnarvon, Darwin and the proposed station at Townsville.



*Transmission Supervisor Tom Rowan operating computer control keyboard. (Courtesy ABC).*

Seventeen studios, in one and two person configurations, are available for presentation and recording work. There is also a single multi-track production suite.

Output from the one person studios goes directly to air via Master Control and the transmitters. The two person units – a studio/control room combination – are used mostly for recording work. Control Room output is fed to Master Control and can also go to line. Each room can be separated electrically and the individual outputs fed to line.

All transmissions to air are recorded in Master Control on a one-inch 21-track logging tape. The tracks cover all transmitter program lines plus the Telecom talking clock. Each spool can hold 24 hours of programs.

Master Control also houses an extensive monitoring system which distributes material throughout the building from a variety of sources. It draws upon studio output, three shortwave receivers, single FM and AM tuners, and TV audio.

Transmission supervisors staff RA Master Control for 21 hours daily. They are shift leaders, monitoring incoming and outgoing material and supervising the work of 12 operations officers. Outside business hours, these senior personnel are effectively in charge of the centre.

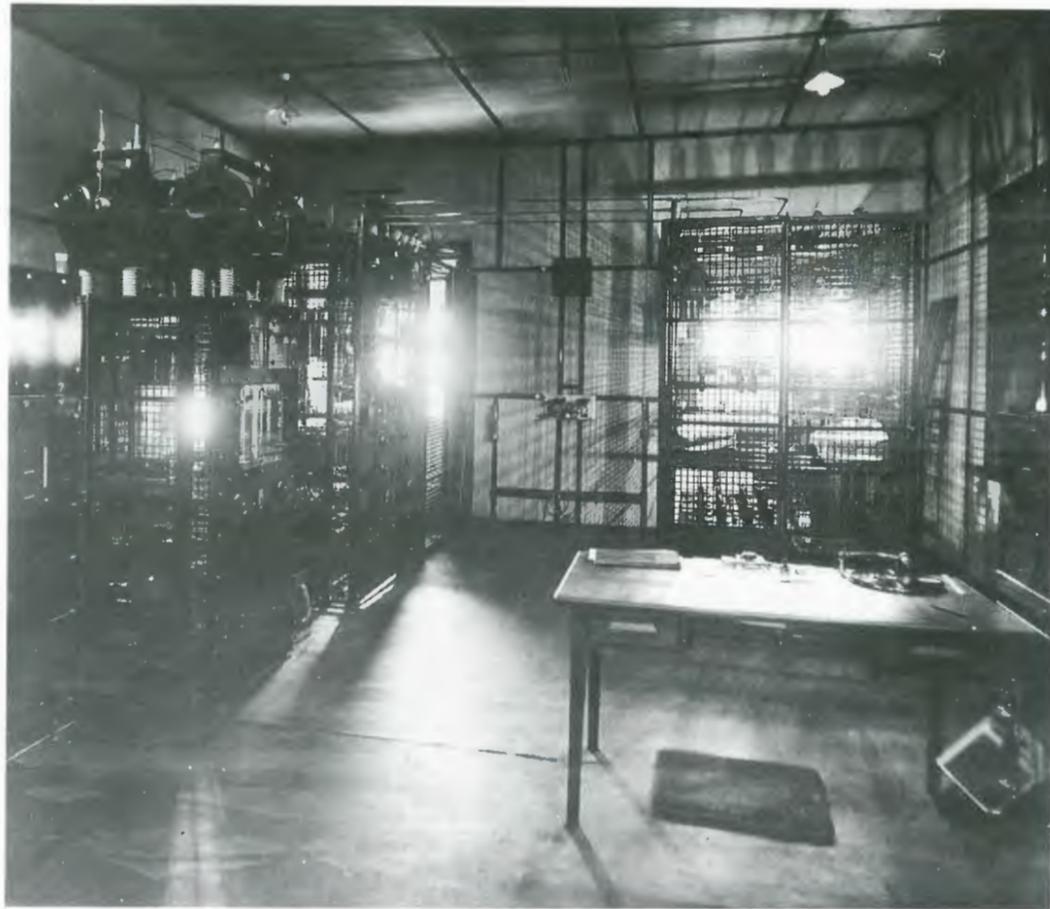
For nearly 50 years the voice of Radio Australia has reached out to every corner of the earth, and today it has an audience of many millions. To some listeners perhaps, it represents no more than an hour or two's entertainment from afar. To others it is a vital lifeline of truth.

KEITH SYNNOTT

**RADIO AUSTRALIA**  
Sharing the world with our friends.



*Master Control Room, Radio Australia Centre, Melbourne. Transmission Supervisor Tom Rowan. (Courtesy ABC).*



5CL Adelaide 1925.



7ZL Hobart 1958.

## Around the Clock

### 24-HOUR MF BROADCASTING

The National Broadcasting Service reached another milestone in its history on 1st August 1987 when a major part of the network began 24 hour operation. When Radio National increased its program hours on 24th January 1988, the entire NBS network provided continuous transmission for ABC programs.

For at least 20 years from the commissioning of the first A Class stations, which were the forerunners of today's National service, stations closed down for intermissions several times during the day. The notion of broadcasting as a continuous flow of words and music had not yet arrived.

Stations did not commence transmission before midday during the first 12 months of operation. A typical schedule for 2FC for example was divided into four sessions. They were:

- |      |                       |                         |
|------|-----------------------|-------------------------|
| i.   | Midday session        | 12.55 p.m. to 1.15 p.m. |
| ii.  | Afternoon session     | 3.30 p.m. to 5.00 p.m.  |
| iii. | Early evening session | 6.30 p.m. to 7.15 p.m.  |
| iv.  | Night session         | 8.00 p.m. to 10.00 p.m. |

By mid 1925 morning sessions had been introduced for Melbourne and Sydney stations. For 2BL there were two sessions with an early session from 8.00 a.m. to 9.00 a.m. followed by another session commencing at 11.30 a.m. The 2FC morning session ran from 10.15 a.m. until 11.30 a.m. The programs comprised mainly news, weather information and talks of special interest to women such as cookery, fashion, gardening, and women's sport.

By mid 1926, 2FC had brought its morning session forward to 8.00 a.m. but 2BL had abandoned its morning session. All the other A Class stations, 3LO, 3AR, 5CL, 6WF, and 4QG commenced after 11.30 a.m. except 7ZL Hobart which had a session 11.00 a.m. to noon, but did not recommence until 3.00 p.m.

In 1927 both 2FC and 2BL operated with six sessions throughout the day, commencing 7.00 a.m. and closing down at 11.00 p.m. Most other stations throughout Australia had no morning transmissions except 7ZL which still had an 11.00 a.m. start.

When the Government was giving consideration in 1928 to acquiring the A Class stations to form a National Broadcasting Service, all stations had a morning session with commencing times varying from 7.00 a.m. to 11.00 a.m.

In 1936, by which time the Australian Broadcasting Commission had been in charge of program arrangements for four years and a start had been made with the provision of regional outlets, transmission hours still followed the pattern of specific sessions with close down periods between each session except that there was no shut down between the evening and night programs.

By 1938 a second metropolitan transmitter was in operation in each capital city giving, with regionals, outlets of 23 transmitters throughout the nation for the ABC programs. With a few exceptions, programs for week days were broadcast 6.30 a.m. to 10.15 a.m. and 12 noon to 11.30 p.m.

The break in the morning transmission hours was subsequently closed, but over the past 50 years, only minor changes have taken place. The start up time was advanced to 5.00 a.m. and the shut down extended to midnight.

From the early days broadcasting has provided an essential service different from the press and other sources of information and entertainment.

We should be surprised if we could go back to the world before broadcasting, to find how much we rely upon it nowadays.

We may not even turn on the receiver for quite long periods, but the set is there, and the turn of the knob will, if not at the moment, at some fixed and reliable time within the next few hours, bring the latest news bulletin, or an enjoyable entertainment program.



4QS Dalby 1939 (Photo E. L. Nissen).



6KF Karratha 1987.

JACK ROSS

## Our Broadcasting Pioneers

### Mr. F. P. (Frank) O'Grady

Frank O'Grady joined the Postmaster General's Department in Adelaide in 1917 and after a short break in private industry returned to the Department. In 1925 he qualified as an Engineer.

When responsibility for running the technical side of the newly formed National Broadcasting Service was transferred from the Wireless Branch to the Engineering Division in 1930, it came under Frank O'Grady's control.

At the time of the take-over from Central Broadcasters Ltd., the 5CL service was in a very precarious state. The studios were run down with patched-up, unreliable equipment held together with very doubtful wiring, and had shocking acoustics. The studio microphones were mostly of the condenser type with 130 volts d.c. across the plates. They were prone to sudden failure



*Mr. F. P. O'Grady, C.B.E.*

at any time. The turntables were of the 'spin start' type and were liable to run backwards.

The transmitter was even worse and many a night session finished with the operator holding a faulty brush against the commutator of a bias or filament generator. If both machines were in trouble then the session finished early.

The final stage had been changed by the Company some time earlier to include water-cooled valves, replacing the original four air-cooled 'football' valves. The water-cooling arrangements were very primitive and unreliable. The modulation choke was mounted behind the operator's desk without any protection, and the 15 kV EHT feed to and from this item was a bare copper wire running up the wall and along the ceiling to the final stage.

Frank charged straight into the mess with characteristic enthusiasm and skill. Under his direction the service was made safe and reliable while he set about the complete rebuilding of studios and transmitter equipment.

Frank chose the site for the first S.A. regional station, 5CK at Crystal Brook in 1931 after a physical survey of the area.

The broad design of 5CK was used as the model for many of the changes at 5CL but along the way Frank experimented with a number of different modulation methods including grid, low and high level plate, and suppressor grid. He also tried different output coupling arrangements, finally settling on the pi net as used at 5CK.

The speech input equipment and program lines were upgraded and after many experiments, the master oscillator finally became an STC oven-controlled, crystal oscillator of high stability.

The original full-wave, three phase, six valve air-cooled rectifier was replaced with a three phase, three valve water-cooled system which reduced the ambient temperature in the building and was much more reliable. The whole station was now stable and consistent.

The antenna at 5CL had always been unsatisfactory. Its pattern has been directional due to the slope of the wire and it was hard to feed satisfactorily. With assistance from Research Section experiments were made with shunt feed to the 60m mast. These were not very satisfactory due to the limited height of the structure and finally in 1944 the mast was jacked up and the bottom attached to an insulated spider. A 200 ohm, 5 wire transmission line from the transmitter ran into a coupling hut at the base of the mast.

Although the studios had been brought to some degree of reliability over the years, they were still far from satisfactory and in early 1935 work started on the complete replacement of all the equipment and the introduction of a new operating concept whereby each of three studios had its own control room and operator and fed into a Master Switch Room where all external switching was carried out. The new equipment was completely a.c. mains operated and it was believed to be the first time in the world that this had been done.

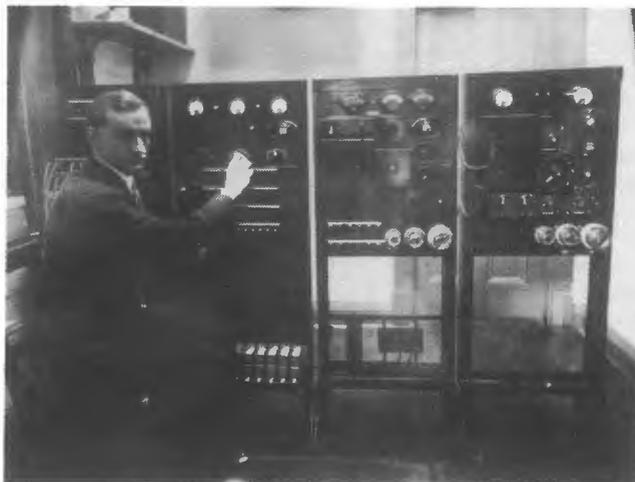
Not long after 5CK came into operation it became evident that there were shortcomings in some areas of the equipment and Frank set about putting these right.

The filament, bias, and HT supplies up to 4000 volts were supplied by three sets of motor generators each of which was duplicated as a change-over arrangement (the dressing of a 3000 volt commutator even with the field control wound back, was a dicey operation).

He was a first class radio and telecommunications engineer, a visionary yet with his feet firmly on the ground, innovative, always using his staff and facilities to the best advantage. He was ready to try new ideas and was a born leader, loyal and friendly at all times to his staff who admired him very much. He had a quiet sense of humour, was never rattled and was great to work with.

In 1961 Frank became Director-General Post and Telegraphs and retired in 1965. He was awarded the C.B.E. in 1965 for outstanding contributions to the development of telecommunications.

TED McGRATH



*Frank O'Grady at 5CL studio control panel 1931.*

## Broadcasting Antennas

### SRRN ANTENNA SUPPLIER

A considerable amount of material necessary for implementation of the Directorate's Capital Works Programs is supplied by overseas manufacturers. One such supplier is SIRA Sistemi Radio of Italy, who through their Australian Agents Magna-Techonics (Aust) Pty Ltd have contracted to supply 116 omni directional circularly polarised FM antennas and 18 splitters for the Second Regional Radio Network.

During a visit to the factory last year, John Hodgson was able to observe the extensive design, manufacturing and testing facilities, and brought back a number of photographs and some technical data.

The company was founded at the beginning of 1977 by a dedicated team of engineering specialists qualified in the sound and broadcasting field.

Important contracts were received from RAI, the Italian national radio-television organisation, for the third television channel antenna arrays in a new UHF network, which is now in service on an extensive basis. In addition, significant work was undertaken to provide ancillary equipment including



*Development Workshop facility.*

changeover units, combining units and coaxial transmission lines to complete the overall system.

With the large growth of independent private radio and TV stations, their business soon diversified so that the State organisation content amounted to approx 10% of their activity. One of the prime requirements of the private concerns was an emphasis on speedy delivery, and SIRA soon learnt to cope with forward stock planning and peak loads by using quality sub-contract manufacturers. Final assembly and testing was retained in-house, so that there was no sacrifice of performance.

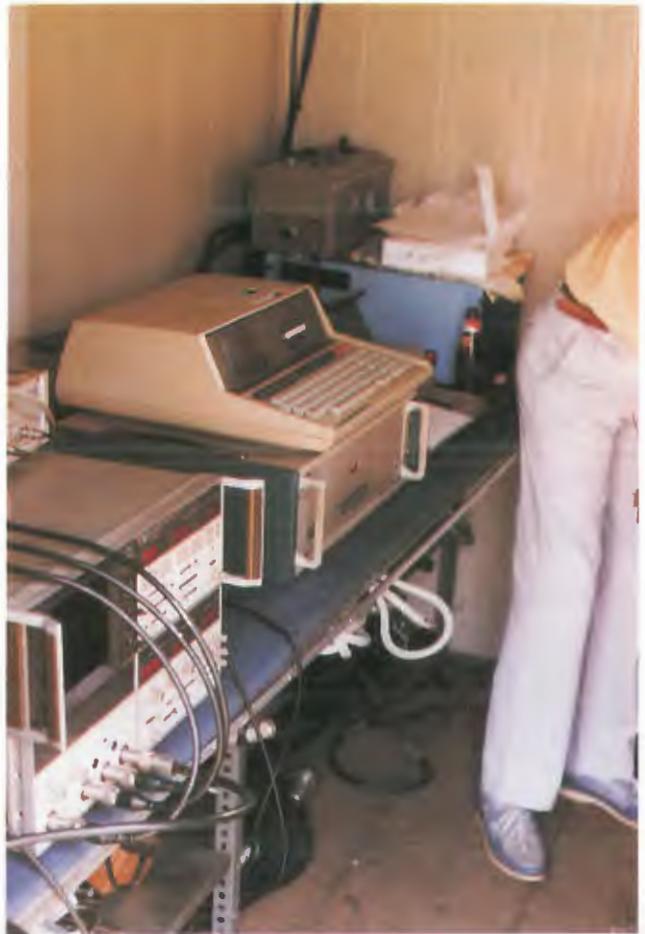
In the early 1980's, they were in a position to respond to export enquiries, and have been successful in obtaining business in every continent, with manufacturing licence arrangements a key part of the business plans. In addition to Australia, their products have been exported to broadcasting organisations in Canada, USA, South Africa, China, Norway, Switzerland, Austria, Ireland and Iceland.

A significant objective for SIRA is to maintain its lead by continuous technological development. To this end there is substantial re-investment in engineering which involves nearly 25% of the company's personnel. Use is made of computer modelling at the design stage and in the final test evaluation to ensure that a customer's complex pattern design is met.

Magna-Tech and SIRA signed a manufacturing licence agreement for the assembly of their wideband, band IV/V, UHF antenna panels in Australia. It is possible to build-up arrays using individual panels so that a high power 40 kW station may need 20 to 30 in a carefully designed phased arrangement to achieve the required service pattern, which may include beam-tilt and null-fill.

These arrays will be assembled by Magna-Tech in Australia from locally made panels and testing facilities will be established to ensure proof of performance.

JOHN HODGSON



*Computer controlled radiation pattern plotting facility.*



*Antenna rotator with UHF antenna mounted for test.*

## CENTRAL OFFICE

Peter Sharpe returned to the Queensland office after spending about 12 months in the Finance and Resources Section. Unfortunately he had a car accident whilst travelling north and his injuries have kept him from work for a couple of months.

John Lawrence and Phil Davey have returned to Broadcasting after working in other areas.

Terry McManus has returned to the Directorate after a few years in the Department of Communications. He is experiencing the delights of working as an Engineer Class 3 in our Development Branch.

Yohani Musafar started as Secretary to the Deputy Director and Craig Sandford has been promoted to a Clerk Class 2/3 in the Victorian Branch Office.

## QUEENSLAND

News has been received of the death of Vern Kenna in Sydney on Boxing Day 1987 aged 79. Vern was one of the true pioneers of the National Broadcasting Service having worked on 4QG Brisbane at the time the Government took over the station in 1929 as part of the NBS. He made an outstanding contribution to the development and expansion of the sound broadcasting and television networks occupying various positions in Queensland, Central Office and in later years with the Australian Broadcasting Commission where he was Controller of Technical Services on his retirement in 1968.

Allan Garner State Broadcasting Manager spent an enjoyable period in Perth during January relieving Don Purdy, SBM Western Australia. Brian Cleary acted as SBM during Allan's absence.

Geoff Wilson Engineer Class 1 on rotation duties left Broadcasting to return to Telecom mainstream after 12 months.

A welcome is extended to Richard Womock Engineer Class 1 who commenced with the Branch during January.

Graeme Offer Assistant Personnel Officer was married during January. Congratulations and all the best Graeme.

Bruce Berry Tech ABRQ3 Rockhampton has transferred to Radio Australian Darwin to try his hand on high power transmitters.

## SOUTH AUSTRALIA AND NORTHERN TERRITORY

State Broadcasting Manager Jack Ross retired during December, and Rod Cunningham formerly of Engineering and Operations Departments S.A. has been provisionally promoted to the position. Rod was recently on temporary transfer to Central Office as Manager, Tradelink in the Commercial Services Department. Graeme Wilmot took up appointment as OIC Radio Australia Darwin followed by the recruitment of David Joseph TO2 from Shepparton and Bruce Berry TO1 from Rockhampton to the station.

Eric Newman Radio Australia Darwin proceeded on a holiday in the southern States, and whilst there married Helga. During his absence relief was provided by Bob Gilliland from Training.

Veronica Pattison Clerical Assistant and her girl friend made a spur of the moment decision to drive from Darwin into Western Australia between Christmas and New Year, proceeding as far as Broome. Except for a minor accident when Veronica nearly drove over a crocodile while crossing a creek, it was a successful holiday.

Alan Holland from Radio Australia relieved as STO2 in the Northern Territory District, and Chris Cooper Engineer Class 2 returned to the NSW Broadcasting Branch.

John Wilkins Engineer Class 3 NT Section announced his retirement effective 4th March, 1988.

## WESTERN AUSTRALIA

State Broadcasting Manager Don Purdy took some well earned Recreation Leave commencing Christmas Eve and Allan Garner SBM Queensland flew across the continent to keep the ship on the right course.

Harry Hermans, Radio Australia Carnarvon, retired late last year. In 1963 he started with NASA at the Carnarvon tracking station, and after closure of the station worked with Brown Boveri on the installation of the 250 kW transmitter for Radio Australia. In 1976 he was offered a position on the RACAR staff and remained at the station until retirement. Staff wish Harry and wife Tina all the best in retirement.

Gordon Hall STO1 RACAR has transferred to STO1 Head Office Perth, Greg Soudure formerly shift leader Wagin has been redeployed to Perth Central District and Gary Coles has transferred from Mawson to Kalgoorlie, Central Country Region, Operations Department.

Late last year the Branch initiated a medium for recognition of persons making that extra effort by presenting Certificates of Merit. The first awards went to Rod Gale, Jeff Keith, Colin Kay, Lloyd Jury, Ross Stewart, Doug Roxburgh, Kevin Bogensperger and Frank Vandervalde.

## NEW SOUTH WALES

Chris Cooper Engineer 2 returned to home base at the end of January following a period in the Darwin Office of the South Australian Branch. Chris welcomed the challenge in working with high power Radio Australia transmitters and certainly cut his teeth on dealing with major operational problems when both main and standby EHT transformers of one transmitter failed dramatically requiring transport to Sydney for repair.

Ken Nugent TO1 of Engineering and Construction Section won the Telecommunication Society Annual Award as a result of his outstanding academic achievement during training as TTO and his 'on the job' performance. Congratulations Ken.

Sandy Fair TOIT, Dennis Upton STO1 District 8, Geoff Black Tech Mt. Ulandra, Barry Turnbull Tech Mt. Bingar and Phil Zikan TO1 Brown Mountain transferred to other areas of Telecom activity. John Vadervliet Tech Mt. Sugarloaf is now working with the Federal Police, David Govier TO1 Mt. Ulandra is trying his hand at teaching computers in a Technical College, Ian Parsley Tech., Gore Hill has moved over to private enterprise, Andy Deans STO1 Gore Hill has transferred to DTAC and Oliver Thistleton Cleaner, Brown Mountain, retired.

In the training area, Mahammad Bardough and Ian Buchan graduated as Technical Officers and Ray Strickland reached the vestibule grade.

## VICTORIA

After 46 years of service, Jack Carnell Broadcasting Operations Manager, retired on 10 February, 1988. Apart from a brief secondment to the Attorney General's Department, Jack's career was entirely devoted to broadcasting. He commenced as a Technician in the switchroom of the Lonsdale Street ABC Studios in Melbourne and progressed through a number of OIC positions including Mont Park High Frequency Receiving Station, Broadcasting Installation Depot, 3LO/3AR Sydenham and Yatpool National TV Station before another secondment to an office position of PTO Radio Section. Best wishes Jack for a long and happy retirement.

Bill Miles and Mark Dennis have transferred to the Business Networks Branch while other staff moves include Robert Priestley to Metro Network Engineering, Ross Walker to St Leonards District Telecom Branch, N.S.W. and David Joseph to Radio Australia, Darwin.

Promotion have seen David Duffin take over the position of Broadcasting Operations Manager and Greg Woolstencroft take up an STO2 position in Central Office. Further promotions are Keith Dahlberg to ES&T Supervisor Gr. 1, Russell Rolls to STO2 OIC, MIC Sydenham, Cathy Murdoch and Con Giovas Clerk Class 4 and Craig Sandford to Clerk Class 2/3. Congratulations and best wishes to all concerned.

# Transformer Failure

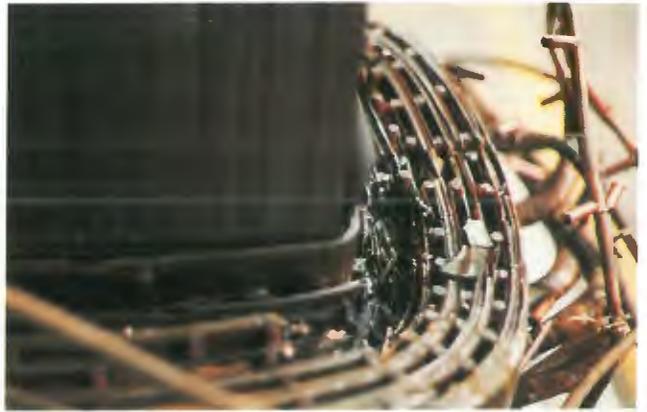
## TWO EHT TRANSFORMERS DAMAGED

At 9.15 p.m. on 5 June 1987 staff at Radio Australia Darwin were happily going about their routine tasks when they were alerted by a loud noise which appeared to originate in the power room of one of the Collins 250 kW transmitters. The shift leader rushed to investigate and was confronted by an 'inverted waterfall of smoke' exuding from the EHT transformer and proceeding upwards and out of the vent. The ventilation design of the power area was so good that there was no odour in the main transmitter area to warn of this obviously serious problem. The temperature of the eight tonne transformer and its 3500 litres of oil had risen to boiling point.

Removal of the hot transformer and replacement with the station spare was a major exercise, but the transmitter was back on air in about 26 hours. Within 24 hours the spare also failed and as no repair facilities were available in Darwin, both units were transported to Sydney. It was nearly six months before the station was back to normal.

The 15 kV transformers differ from most others at broadcasting stations in that the EHT rectifier stack and associated switches are located inside the transformer case.

Inspections later revealed that the windings of both transformers had serious short circuits in approximately 30 per cent of the coils. Copper particles were dispersed throughout



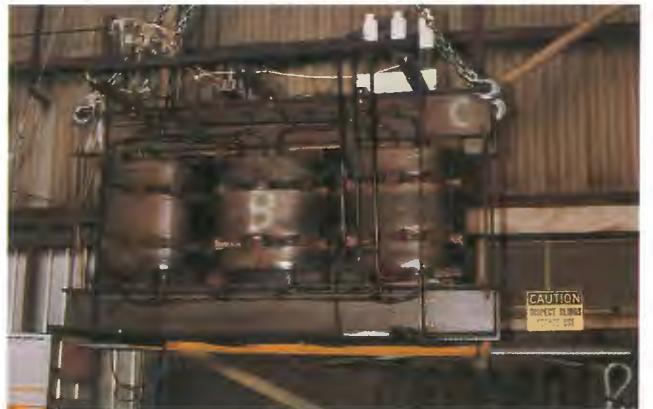
*Centre limb damage.*



*Damage to secondary winding.*



*Transformer tank with core removed.*



*Core of spare transformer.*



*The transformers in repair factory.*

much of the other coils. The original unit failed due to the growing short circuit and arcing between turns in one of the primary windings which had been melting the windings and splattering copper throughout the rest of the transformer. The spare unit failed due to poor internal connection and localised heating at that point in the winding.

As a general rule, a short circuit between adjacent turns of a coil may be caused by the presence of sharp edges on the copper conductors. If the transformer vibrates when on load, or if the windings are subjected to repeated electromagnetic shock, through frequent switching operations, these sharp edges will cut through the insulation and allow adjacent turns to make metallic contact.

A short circuit between turns may result from the dislodging of one or more turns of a coil caused by a heavy external short circuit across the windings. Breakdown may not occur immediately the turns are displaced, but should the transformer vibrate while on load due to looseness of core bolts, or should it receive repeated heavy electromagnetic shocks, abrasion of the insulation between adjacent dislodged turns will most likely take place, so producing a breakdown.

CHRIS COOPER

## Profiles

### VIC AUDET

Vic Audet, Broadcasting Engineering Manager New South Wales, started his engineering career with Amalgamated Wireless (Australasia) Limited as a trainee engineer in 1954 and graduated with the Diploma of Radio Engineering in 1960. In the following years he worked on the development of high power communication transmitters until he joined the then Post-Master General's Department in 1966. Here he was employed initially in the Radio Section on the maintenance and operation of the radiocommunication network.

One of his important projects as Engineer Class 2 in this area was his involvement with the NASA Apollo lunar space program (Apollo 10 - Apollo 17). During these ventures he was responsible for microwave links from the Honeysuckle Creek tracking station and the Parkes Radio Telescope, and for liaison with NASCOM.

In 1974 he transferred to Broadcasting where he took up the position of Senior Engineer Colour Television responsible for the colour conversion of the main National television stations in NSW. In 1977 he was given charge of Broadcasting Construction, the establishment of transmitters in the new Black Mountain Tower being one of his initial projects. His responsibilities have covered the National FM service, National TV services, the SBS UHF television services, and Remote Area Television via Intelsat and Aussat.

With the formation of the Broadcasting Branch, Vic continued to perform as Senior Engineer Broadcasting Construction until his recent appointment to Broadcasting Engineering Manager.

Vic's spare time is shared between librarian activities with the local shire brass band, a keen interest in amateur astronomy, and enjoyment of classical music.



*Vic Audet*



*Ron Johnson*

### RON JOHNSON

Ron Johnson has been the Broadcasting Operations Manager in New South Wales since March 1986. At 40 years of age, he has been with Telecom for 25 years, having commenced as a Technician-in-training in January 1962.

Ron has spent his whole career in radio, including microwave and broadcasting areas, fulfilling his childhood career ambitions.

In the radiocom area he worked on the Moomba (SA) to Sydney natural gas pipeline radio system, and on the NASA systems during the Apollo moon landing missions and space shuttle program. He was involved in setting up the Sydney Mobile Radio Telephone Service, and has been second-in-charge at both the Redfern and Waverley Radiocom Terminals in Sydney. He was OIC at the Redfern Radiocom Terminal immediately prior to taking up the Principal Technical Officer position in NSW Broadcasting Branch in January 1984.

Off duty his hobbies include playing the guitar and mandolin, and flying light aircraft. Ron has a private unrestricted licence and owned a half share in a Cessna 177 for five years. He also has a motor cycle licence, a boat licence, and of course a car licence.

Ron also likes travelling when time permits. Stops have included south-east Asia, the Pacific islands, Hawaii, New Zealand, and all States of Australia.

### KEL STANSFIELD

Kel Stansfield, Principal Technical Officer Operations in the Broadcasting Operations Section New South Wales, has been associated with broadcasting activities from way back.

Kel commenced work with the Postmaster General's Department in Melbourne in 1950 as an Exempt Technician. He spent some nine years working at the ABC Melbourne Studios on nearly all the usual functions encountered at studios including operation, maintenance and outside broadcast activities. He was there at a time of rapid technological change in studio technical equipment. There was the introduction of wire recorders quickly followed by tape recorders, condenser microphones and lightweight OB equipment. The introduction of many new facilities were not without their problems. For instance when portable wire and tape recorders were first introduced they were operated by the technical staff, not the ABC staff member. His role was to conduct the interview, not to operate the equipment.

From studio work Kel transferred to station inspections where he spent much time travelling throughout the State assisting with transmitter proof of performance and other matters associated with the operation of the network. He subsequently took up duties on the staff of television station ABCV1 Bendigo.

In 1965 Kel decided it was time to move north and went to television station ABQN5 Mt Cenn Cruaich in New South Wales as Officer-in-Charge. He took up his present position of Principal Technical Officer in April 1986.

Outside of the office, Kel enjoys a game of bowls and when weather permits, a relaxing afternoon at his favourite fishing spot.



*Kel Stansfield*



*Bill Paraska*

### BILL PARASKA

Bill Paraska has been the Broadcasting Administration Manager, New South Wales, since January 1985, having succeeded Keith Nisbet following Keith's retirement. Prior to promotion, he was Resources and Budgets Officer. Bill has been with Telecom for more than 12 years, and for nine of those years, he has been associated with the Radio Section and the Broadcasting Branch. In 1984, on formation of the Broadcasting Branch, he played a significant part in its establishment. He assisted in preparation of documentation for the organisation, with accommodation, acquisition of furniture, and co-ordination of the telephone and telex facilities. He also played a leading role in improvement of the Branch's costing system when he devised an adaptation of the then NSW financial systems to allow full recording of costs for each transmitting service in the State.

During 1984-85 Bill was a member of the Working Party formed to investigate and report on ways to improve financial and accounting procedures within the Directorate. During the work he attended meetings in Melbourne, Adelaide, and Perth.

In his time away from the office, Bill is busily occupied assisting his wife and two children while at the same time renovating his old home. He also finds time for study with his external degree course in Accounting and Computing.

# Network Monitoring

## RECORDING AND INFORMATION SYSTEM

The Broadcasting Directorate is responsible for the daily operation of about 600 broadcasting services throughout Australia. The majority of these services operate in an unstaffed mode and in order to ensure that the stations function satisfactorily and operate with high reliability, a comprehensive network monitoring system has been set up.

Effective monitoring of the network is required to ensure.

- resources are applied in the most efficient and cost effective manner.
- off-air time is kept to a minimum
- the ABC, SBS and DT&C are informed when transmissions are interrupted.
- equipment performance can be assessed for:
  - design problems
  - fault trends
  - maintenance routines
  - spares provisioning

Each State has at least one Monitoring Information Centre (MIC). These are in most instances located at either a sound broadcasting or television station site.

The responsibility and work undertaken at each MIC varies slightly, but in general its function is to:

- monitor services where practical.
- receive follow-up action as required
- record all alarms, faults and follow-up action as a Branch report each day.
- liaise with Broadcast Districts in regard to faults, outages and status reports etc. as required.
- initiate BROADCASTS as required.
- notify ABC, SBS and BOM of faults and outages as required.
- check all supervisory systems regularly.
- edit fault and outage reports prior to TACONET input daily.

In order that State and Central Office management may have a full appreciation of the status of the network, daily inputs are made to the Telecom Australia Computer Network (TACONET) main frame data base.

The TACONET data base can be accessed by any authorised user to provide a variety of standard management reports. These reports are obtained by following a simple menu system. Additionally, the data base can be scanned to pick out any wanted parameter or to perform sophisticated data analysis.

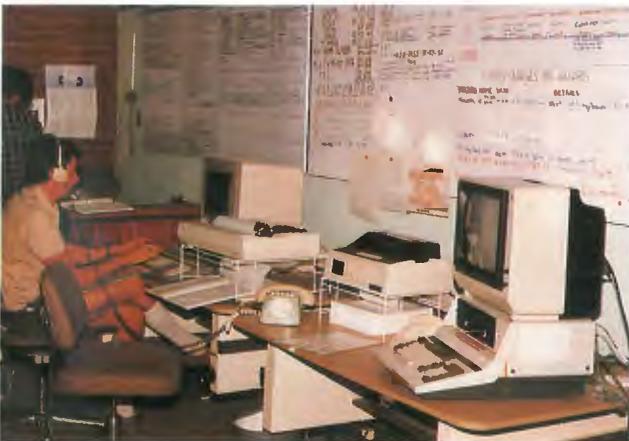
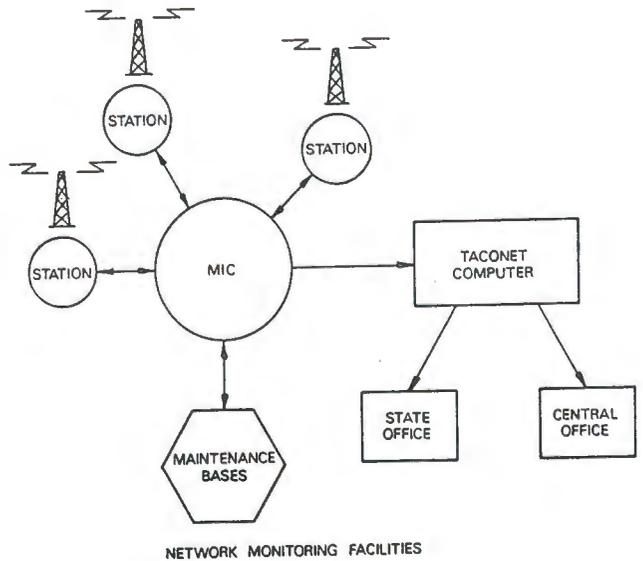
Currently the automated side of network monitoring is being extended to cover the bulk of the network by the installation of ACTTS or ADAM units. Meanwhile data is keyed into the MIC terminal on the basis of verbal or telex reports from those stations without ACTTS or ADAM's.

The TACONET system also serves a useful base for record purposes. The data base contains a complete set of essential details relating to each service e.g. transmitter make and type. This information is used with fault and outage data to produce reliability reports.

CHRIS DOBSON



MIC Sydenham Vic. Max Bartlett (L) and Phil Lowe.



MIC Perth WA. Jim Ramage operating equipment.



MIC Mt Lofty SA. Peter Williams at desk.

# Fire!

## THE NIGHT THE STATION BURNED DOWN

It is now over 30 years since this traumatic event, and though I feel it is better for psychological reasons to try to forget these shattering experiences, the memory still occasionally recurs, unbidden in all its ghastly detail.

The 4QN transmitter was built on saltpan type country about 40km from Townsville and due to its relative isolation and difficult access in the 'wet season' had its own power generation facility and residential accommodation for the staff. The usual population varied from 10 to 20 depending on the number of children at the time.

My residence was closest to the station buildings, and one was always conscious of the background noise from the power house, usually waking drowsily when the main engine closed down at 11.30 p.m. and the smaller generator started up to run till 5.00 a.m. next morning.

All was normal on this particular night till about 3.00 a.m. when I awoke to the sound of gunfire, as though an army of duckshooters had invaded the nearby swamp. The noise kept getting louder, however, and on looking out the window I was horrified to see a burst of flame coming through the station roof. The noise was obviously that of the fibro roof disintegrating in the intense heat and flame.

Asking my wife to try to 'phone the Engineer in Townsville (the 'phone was always patched through to the residence after hours), I went to the station to see if anything could be done. Luckily the 'phone patch was still intact, and the call was successful.



*Roof of transmitter building.*

Luckily, the standby transmitter was housed in a separate building a few metres away, and although so close, it survived with no damage at all.

The Townsville Engineering, Technical and Line staff all rallied to the cause, cables and transmission line diverted to new locations, a portable generator set hired, transported to the site, overhauled and wired up, and we were back on the air testing within 14 hours of the fire first being noticed. Refinement to the temporary set-up was carried out during the remainder of the night, and normal service was resumed at opening time the following day.

The resiting of 4QN had been under consideration for some time and the fire decided the question. It is now located at Brandon and operates with a 50 kW transmitter.

GEOFF BEETHAM



*Transmitter before the fire.*

The station building was a large clay brick structure, cavity walled, with a fibro roof supported by large dimension oregon pine timber. It housed the main transmitter, a vintage water-cooled 6 kW type, workshop, store-room, office etc., and the power house section containing two large main diesel generators and two small ones.

Inspection of the fire revealed a hopeless situation, the whole internal area being a mass of flames fed by the pine roofing timbers, most of which had already collapsed. The building was virtually a perfectly designed incinerator with hardly any heat noticeable outside the walls, but a raging inferno within. The destruction was so complete that investigation was unable to determine the cause, and electrical fault was assumed.



*Damaged cabinet.*

## 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,

During the Annual Conference of the Institution of Engineers, Australia, held in Darwin from 11th to 15th May, last year, I had the pleasure of inspecting the Radio Australia installation on Cox Peninsula.

As a member of the group that visited on Thursday 14th May, I was impressed with the knowledge and efficiency of the staff. For me personally it was not only technically interesting, but also something of a sentimental journey. Having firstly lived in Mount Isa as long ago as 1938-40, and in the post-war years from 1946-68, and later in Tennant Creek from 1968-74, Radio Australia shortwave broadcasts and later associated PMG repeater broadcasting stations were a primary source of news and entertainment.

Besides the service and popularity of Radio Australia in broadcasts in South East Asia and other countries, I was also most pleased to learn that the Northern Territory is now well covered by short wave broadcasts with local Territory programs and also special programs to aboriginal communities in all remote areas.

This is a tremendous improvement from the days when low powered repeater transmitters, such as at Tennant Creek, could seldom be received outside a radius of 60 to 80 kilometres from the transmitter.

EDWARD DAVIES

Sir,

In 1959 I conducted the first formal technical investigation and assessment of the reception and effectiveness of Radio Australia transmissions in the area from India through to Japan and the Philippines. There are many stories arising from this trip particularly from the appearance in some not-too-sophisticated countries of a battery-operated portable receiver calibrated as a FS meter but perhaps the strangest occurred at the border between mainland China and the Hong Kong New Territories. In those days it was "Red" China and a prime target for broadcasts but there were very few reception reports except from refugees. A visit to China was out of the question so I took a bus from Kowloon to the border village of Shenzhing (about 25 miles) to be as near as possible to the target area and set up the receiver on a convenient rock outside the village wall about 50 yards from the entrance gate. The village is on the southern bank of a river which constitutes the border at that location and I was soon surrounded by a growing crowd of intrigued onlookers none of whom spoke English. This soon attracted the attention of border guards on the Chinese side of the river only about 150 yards away with much gesticulating and peering through binoculars.

Apparently all they could see was a crowd milling around outside the village for some unknown reason. Soon they shouted instructions (or abuse?) over a loudhailer but even this failed to have any effect on the crowd. After about three hours of listening and note-taking, and feeling like a monkey in a zoo I went back to my hotel in Hong Kong. (At least the exercise had shown that reception was reasonable in Southern China – what I could not determine directly was the effect of Russian jamming on reception further North). Later the next day I heard from the Australian Trade Commissioner that reports had come in to the effect that Chinese border guards had lodged a complaint about some unspecified nefarious activity at Shenzhing the previous day.

DOUG BROOKE  
RETIRED, CENTRAL OFFICE

## Fuel Storage

### EMERGENCY POWER PLANTS

Diesel generating plants have been widely used since the establishment of broadcast transmitters. Some early stations, notably 4QN, 3WV and 6WA relied entirely on local generation of power using diesel generators but today, diesel generating plant is provided to supply power only in the event of interruption of the commercial mains supply.

Mains power is extremely reliable in most areas and consequently the emergency power plant gets very little use. In fact, most of the usage results from regular scheduled run-ups to ensure that facilities are operating satisfactorily.

This short duration operation creates a problem with the fuel which is often overlooked. Tanks are very seldom run down to a low fuel level but are topped up regularly to ensure the availability of maximum fuel should there be a major breakdown in the commercial supply.

It is not generally appreciated but the nominal storage life of diesel fuel is about 12 months. After that, the fuel deteriorates due to its inherent composition and the storage environment.

Modern practice at broadcasting stations is to locate the storage tanks above ground, on the ground or underground. On-the-ground installations are the cheapest but require pumps. Above ground tanks allow gravity feed and can be cheaply shifted if necessary. Underground installation are the most expensive to provide and require pumps. However, this type of installation has some aesthetic advantages and is also the most suitable for prolonging the useful life of the fuel because an even temperature environment can be maintained. Above ground tanks are subject to high temperatures from the sun so reducing the life of the fuel by degradation.

In addition to high temperature, fuel will be adversely affected by the presence of water or sludge. Temperature changes cause the tank to breathe so drawing in air which may contain a high level of moisture. During a cold night the moist air above the fuel is chilled and dew is formed. The water collects in the tank bottom below the oil because of the weight differential. The water/fuel interface is a fertile site for bacteria which can give rise to sludge formation or sulphurous smells. An unpleasant odour is a sure sign that the oil is deteriorating.

Regular drainage of condensed water and sediment from the tank bottom is essential. The presence of fuel water at the bottom of a storage tank can be detected and the quantity assessed by smearing the bottom of the dipstick with a water-finding paste. This has the ability to dissolve or to change colour in the presence of water.

Crude oil from the Bass Strait wells contain a high proportion of wax which, because of its characteristics, cannot effectively be neutralised by additives. Wax is an excellent component for combustion quality but at low temperatures when it solidifies, it will block lines and filters.

Seasonal grades of diesel fuel are distributed at appropriate times during the year by suppliers. These are summer and winter grades and sometimes an intermediate grade. As the summer grade has a higher cloud point (the temperature at which wax precipitation starts to occur) than the winter grade, problems can occur when stocks of summer grade are used in winter months.

Experience indicates that the lessons to be learned about fuel are that the fuel should be clean, free of water and dirt, the tank should be tested regularly for water and tanks should be run down or emptied on a regular basis.

DAVID NAISMITH

## Broadcasting Milestones

### 3GI SALE

Station 3GI was the first regional station of the National Broadcasting Service in Victoria. It was officially opened on 31 October, 1935 and was designed to serve the region known as Gippsland.

The station was established on a site of about 25 hectares at Longford, about 8 km south of Sale.

The station building comprised a single floor brick structure and separate quarters provided for resident Officer-in-Charge of the station.

The transmitter was manufactured by Standard Telephones & Cables Ltd. Sydney. It produced an unmodulated carrier of 6.25 kW on 830 kHz and was capable of being modulated linearly to 95%. The modulated carrier was amplified in two stages, the first using two 1.5 kW tubes in push-pull and the second with two water cooled SY4222Z type tubes of 15 kW rating.



*Golden Jubilee commemoration window.*

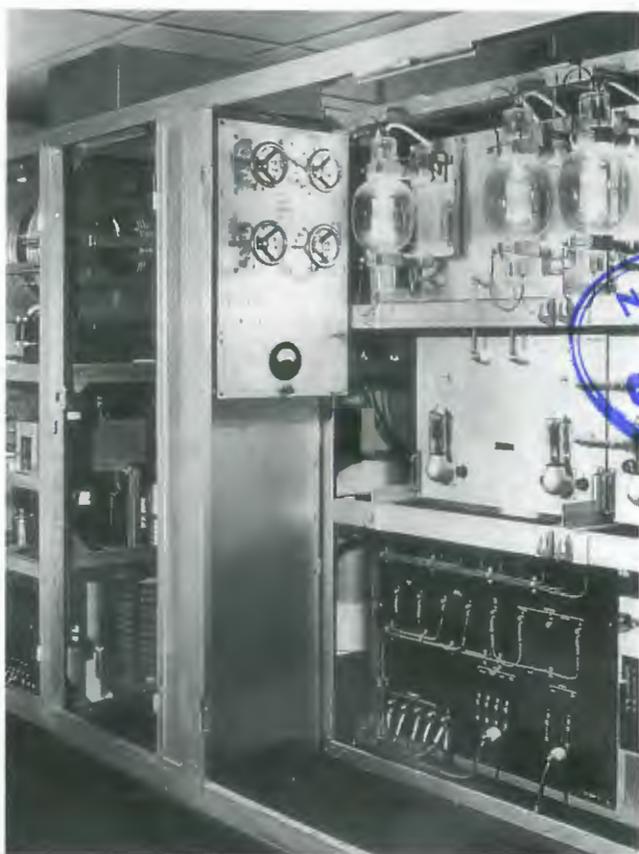
During 1954 the transmitter was replaced by an AWA 10 kW BTM10 main unit together with an AWA 2 kW standby unit.

In 1968 the radiator was modified to a guyed vertical type and fed by a 200 ohm six wire cage transmission line. Current operating frequency is 828 kHz.

On its 30th birthday 3GI was converted to an unattended operation mode, although a resident Technician still provides day-to-day maintenance. Overall responsibility for the station is with the Latrobe Valley TV station staff.

To commemorate the station's Golden Jubilee in 1985, Technician Fred Glover made a leadlight window and mounted it in the lunch room.

RAY WEEKS.



*Final and penultimate stages of original 3GI transmitter.*

A feature of the transmitter was the careful attention to electrical screening of all circuits to minimise interaction. The unit type of construction was employed with all units except the final power amplifier being enclosed in duralumin boxes. The units could be withdrawn on runners for maintenance activities. The front of the transmitter was faced with slate panels and fitted with the necessary controls and meters.

The antenna system was an umbrella type consisting of three wires each of total length approximately three-quarter the transmitting wavelength and symmetrically spaced about the mast. They were commoned together at the tuning hut equipment then about one third of each length was taken out radially from the mast on top of 3.3 m poles, the remainder (half wavelength) being led to the top of the mast. The wires were insulated from the mast, ground and each other after leaving the tuning hut. Transmission line was a two wire 600 ohm type.



*Fred Glover (R) Technician and Les Williamson Labourer with 3GI transmitter.*