

The **BROADCASTER**



Newsletter of the Broadcasting Division

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MOUNT CANOBOLAS—LIFTING UHF ANTENNA

THE BROADCASTER

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

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

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EDITORIAL

The feature article in the March issue of The Broadcaster concerning 70 years of development of home broadcast receivers was apparently enjoyed by many readers, if the complimentary telephone calls I received are any indication.

Several readers suggested follow-up articles on the main features of those early fancy receiver circuit designs such as Tuned Radio Frequency, Neutrodyne, Superdyne, Reflex, Inverse Duplex and others which were all superseded by the Superheterodyne from about the early 1930's.

One ex-broadcaster who lived in England as a youth in 1923, commented that crystal set kits were sold even in shops whose business was unrelated to radio, such as chemists, sweets shops, garages, bicycle shops and farm produce stores. He recalled that some 200 brands were available using at least 30 different circuit designs. Also, such was the thirst for knowledge in the new science, that there were at least 18 periodicals devoted to wireless. Most were devoted to methods of constructing receivers, even to the extent of making coils, variable capacitors, fixed capacitors and resistors.

Oh, for those halcyon days of wireless.

JACK ROSS,
Editor.

Front Cover: Lifting UHF antenna to top of 122 m TV tower Mt Canobolas, NSW

Contributors to this issue:

Leon Sebire	Roger Greenwood	Tom Pascoe
Max Chadwick	Ray Weeks	Graham Shaw
Gary France	Brian Hey	Ted Hewitson
Doug Sanderson	Brian Beyer	Tom Reed
Dennis Hunt	Murray Fopp	Jack Ross
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Doug Smith	Ted McGrath	





Leon Sebire.

FROM MY DESK

The history of organisations shows that there will be significant change at intervals of about six years. It is not surprising that the Broadcasting Directorate of Telecom Australia, which was formed in 1983, would become the Broadcasting Division in 1989. Of course, coupled with the change it was inevitable that a new title would need to be found for the Divisional Head of Broadcasting. It has been determined that I should now be styled "General Manager, Broadcasting" although the desk hasn't changed in any way.

We have just concluded a very successful financial year with our largest ever profit. During the entire history of National Broadcasting prior to 1989/90, the broadcasting transmission responsibilities have been carried out either at cost (prior to 1975) or on "cost-plus" since 1975. During the latest financial year, we entered into a commercial contract with the Department of Transport and Communications which is aimed at increasing productivity and a sharing of the financial gains. Coincidentally, 1989/90 saw the largest program of work ever undertaken by us with a total turnover of almost \$100M for the year.

I congratulate all who have contributed so willingly to acceptance of operation under true business constraints and the results which have been achieved. The new financial year of 1990/91 offers scope for an even higher volume of project work and the prospects of an even better result when we look back on our achievements at this time next year.

LEON SEBIRE

STATION ROLL CALL

ABL2 ROCKY HILL

National television station ABL2 is located on the western side of the city of Broken Hill. The service was commissioned in December 1965 with two RCA transmitters, type TT-2BL, operated in parallel. Programs were fed via the broadband radio link from the ABC Adelaide studios. The antenna system comprised an RCA COEL dipole type mounted on a 42 m tower provided with an aircraft warning lighting system. Feeder was a 1 5/8 inch Hacketh type.

Colour television became available to Broken Hill viewers on 6 December 1978 with conversion of the transmitters to colour format.

An FM stereo service was commissioned in April 1984 using an NEC type FBN-9030E transmitter operating on a power of 2 kW at 103.7 MHz.

The RCA TV transmitters were replaced on 26 March 1986. The new facilities operate on a main/standby mode using a 5 kW NEC VHF transmitter as the main unit and a 1 kW NEC VHF transmitter as standby. At the same time as commissioning the new transmitters, program feed was changed to AUSSAT.

ABL2 is the parent transmitter for the translator at Menindee via a repeater at Glen Lyon Hill.

Commercial television station BKN7 shares the tower with ABL2 employing a Rohde and Schwarz antenna system. However, the transmitters are housed in a separate building and maintained by the commercial company.

DENNIS HUNT

2NB BROKEN HILL

Station 2NB was commissioned on Saturday 29 July 1948, when program was transmitted at 6.55 p.m. The station is situated on the northern edge of the city.

The original transmitters were operated in a main/standby arrangement. The main transmitter was a 1 kW STC type A506 and the standby unit was a PMG manufactured 500 watt model. Station operating frequency was 760 kHz.

Programs originated from the ABC studios in Adelaide and were carried by the open wire route. The ABC maintains a local studio in the city.

In June 1965, the transmitters were replaced and the station converted to unattended operation. The transmitters which operate in a main/standby mode are STC 2.5 kW types derated to 1 kW at the time of installation.

The lattice steel antenna system was converted to a directional type on 17 December 1971 with the erection of a second 77 m mast on a bearing of 14° T and spaced a quarter wavelength from the original mast. At the same time the radiated power was increased to 2 kW and the operating frequency changed to 1000 kHz.

On 23 November 1978 the frequency was changed to 999 kHz as part of the MF band frequency change exercise.

DENNIS HUNT

TELEVISION TRANSMISSIONS WITH DUAL SOUND

For some time now a number of commercial TV operators in Australia have been transmitting stereo sound with a high proportion of their programs. Australia has adopted the standard originally devised in Germany and known as the IRT system which provides for two separate frequency modulated sound carriers to be transmitted at frequencies above the vision information in a standard TV channel.

In recent times all new and replacement TV transmitters purchased for ABC and SBS services by the Broadcasting Division have the capability of stereo sound operation. Eventually, stereo sound operation will be implemented throughout the ABC network, although initially it will be restricted to capital cities and the major regional centres.

The SBS with its large proportion of foreign language programs offers an interesting opportunity to use the two sound channels of the TV stereo system for broadcasting in dual languages; for example, sound tracks in say Greek and English simultaneously. All of the SBS transmitters provided earlier are now being retrofitted with dual language transmission facilities to meet this requirement.

LEON SEBIRE

HOME IS A TRANSMITTER

Over the years there have been reports of possums, rats, mice, lizards, snakes and domestic cats being found inside a transmitter cabinet or cubicle when staff arrived at the station to begin the day's transmission. How many of these intruders found their way into the transmitter was never satisfactorily explained.

In some cases their presence was made known by smashed glass valves, a noisy panic to escape when the technician opened the door and in other cases, by the smell of cooked meat or squeals when EHT was applied to the transmitter.

Darwin staff have added another intruder to the list. The Berry Springs Emergency transmitter some 40 km south of Darwin was found to be the home of a family of Quoll, or native cats.

On a regular fortnightly visit to the station, the Technical Officer discovered a mother with five young offspring perched inside the transmitter cabinet. A frantic chase ensued with only one of the young being apprehended and delivered to the zoo.

On being informed that they were quite vicious, and not wanting to lose any fingers, the TO set up a trap with an apple as bait to entice the remainder of the family out of the transmitter.

Three weeks after setting the trap and blocking off the entrance through the roof air vent, the mother and one kitten were caught.

The cabinet was cleaned out and a detailed inspection carried out. However, only minutes after application of power to the transmitter, one of the now half grown Quoll received a shock when it tried to climb the terminals of a large transformer.

Although badly shaken up, it survived and was taken to the zoo where it has now started a family of its own.

ALAN HUBBARD

UNUSUAL TOWER

During a visit to Milan last year, I came across a strange but typically ornate Italian tower.

The tower is mounted on top of the main 'transmission' hall and commences 62 m above the street level rising to 108.5 m. It is capped by a 4000 kg standing-figure dressed in gold, and not even wearing a safety belt. Positioned around the hall are an additional 135 small towers with about 3700 figures.

The main construction covers some 12,000 square metres and occupies a volume of 250,000 cubic metres and is adorned with 124 big windows of which 51 are stained glass telling the story. All this was started in 1386, some 500 years before Marconi, the celebrated Italian, built his first wireless transmitter. If you ever have the opportunity to get to Milan, the Cathedral known as Duomo is a most incredible and fascinating place to spend some time, but don't bother to take your transistor. The tower is not energised.

GARY FRANCE



Ornate tower in Milan, Italy.

ACHIEVEMENT AWARD

SA/NT Branch management has developed an Achievement Award to recognise significant effort, by a group or single staff member of the Branch, in any work related area.

Too often good work goes unnoticed and unrecognised and acts as a disincentive to staff to put in that little extra effort. The Achievement Award has been developed to provide positive feedback with recognition to staff and a certificate has been designed to allow the occasion to be marked and remembered as a significant memento of the occasion—a framed certificate. The first Achievement Award was presented to a group of SA Communications Officers who travelled to Tasmania in November 1989 at the request of the Vic/Tas Region to repair the lightning damaged TV antenna and radome at Mt Barrow, Launceston. Under adverse conditions the group completed the very difficult task, in very short time. Staff members were Tony Wissenburg, Paul Salvemini, Barry Spicer, Mick Lavender and Paul Nicolle with home base support being provided by Ian Palmer and Brian Fenwick.

GRAHAM SHAW

PRESENTATION OF AUSTRALIA DAY MEDAL TO BRUCE WILSON

On 26 January 1990, it was my great pleasure to travel to Radio Australia, Shepparton, to present an Australia Day Medal to Bruce Wilson, Officer-in-Charge of the station.

The following is an edited version of the speech made at the presentation ceremony:

"About seven weeks ago many of our friends and colleagues, past and present, met here to celebrate the 50th Anniversary of the Radio Australia service. Today, we are gathered together to pay tribute to a man who has had a close association with that facet of our country's recent history, but it is not for that reason that we honour him today.

The National Australia Day Council is an organisation whose principal aims are:

- To foster national pride in all Australians
- To promote the observance of Australia Day
- To instil in all Australians a desire to contribute to Australia's future
- To achieve these aims by encouraging Australians to live and work together as one people, by fostering local community spirit, by stimulating concern for our country and creating awareness of, and value for, our heritage.

The National Australia Day Council makes possible for a wide range of businesses, Government Departments, Defence Forces and Community organisations to present achievement medallions to those people, who in the opinion of their peers, have made a significant contribution towards furthering these aims.

It is my great pleasure to make such a presentation to Bruce Robert Wilson.

Among his colleagues, Bruce has been whimsically referred to as the 'Mayor of Shepparton' or 'Minister for Tourism' in acknowledgement of the considerable contribution he has made towards promoting the qualities of the area. Perhaps, like me, however, you may be surprised to learn just how extensive his community activities have been and I might add—the list is still being extended. May I refer to just a selection:

- Councillor representing the Wilmot Ward of the City of Shepparton from 1970 to 1981
- Served as Mayor 1975 to 1976
- Member of the Shepparton Sewerage Authority—11 years
- Executive Member of the Municipal Association of Victoria 1974 to 1978, including two terms as Vice-President
- Chairman of the Family and Community Services Programme for the Goulburn Region for 8 years
- Ministerial appointment to assist with oversight of local Psychiatric Hospital
- President and playing member of Shepparton Symphony Orchestra
- Justice of the Peace
- Foundation Member of Shepparton Central Rotary Club
- Member of Shepparton Art Gallery Management Committee for over 8 years, during which time he inaugurated a new management structure for the Society
- Executive Member, Regional Galleries Association over several years

- Member of Group Study Exchange Team to Argentina in 1977 and Team Leader 1988
- Inaugural member of City of Shepparton Brass Band
- Member Shepparton District Music Foundation
- Chairman of Music '81 Committee

This Award is presented to Bruce for his personal contributions to:

- The development of facilities for the disadvantaged, disabled and sick
- The promotion and development of the arts
- Service to charitable organisations,

which can best be summed up in the simple phrase, 'Service to the community of Shepparton'.

Before presenting Bruce with this Medallion I must say that I have great admiration also for his wife and family. Without their support and forbearance, none of these achievements would have been possible, and I am sure they will share in this recognition".

MAX CHADWICK

WILL AUSTRALIA HAVE PAY TV?

This question has been asked certainly for as long as Australia has had TV services. It could be said that we had pay TV at one time because when TV was introduced all viewers were required to purchase viewers licences annually. Public pressure quickly put a stop to this and since that time all Australian TV has been "free to air".

These days, pay TV is seen as an alternative for augmenting existing services. It has been suggested by some that commercial TV is about providing advertisers with maximum audiences, national (public) TV is concerned with filling the programming gaps not catered for by commercial TV, and pay TV is about selling individual viewers precisely the types of programs they want. In this regard pay TV can be likened to the prerecorded video tape hire.

There have been numerous inquiries into the desirability of the introduction of pay TV in Australia over the years, the most recent leading to the Saunderson Report of November 1989 which recommended introduction on a progressive basis using Telecom cable/optical fibre systems for reticulation of a relatively large number of channels.

It needs to be noted that the broadcasting of scrambled television on normal TV channels is not an option in Australia because in general, all but one channel have been earmarked for eventual free-to-air TV services on a nationwide basis. One channel would of course not be capable of providing effective operation of a pay TV service.

Cable or optical fibre connections with individual households offer a whole range of services and facilities in addition to TV reticulation and while the distribution costs will be high, only a small proportion of these costs would legitimately be a charge against pay TV. It is also probably inevitable that dwellings will eventually be interconnected by broadband reticulation systems and hence the proposal to carry pay TV on these interconnections seems sensible.

It needs to be noted that the thrust for pay TV comes from entrepreneurs and potential operators rather than from the general public. It remains to be seen if and when pay TV arrives whether the community will flock to be connected or whether free-to-air plus video tapes remain the dominant source of programs sought by the average Australian.

LEON SEBIRE

6AL ALBANY—VITICULTURE

Broadcasting station 6AL Albany, was officially opened on 23 April 1956 following a brief ceremony in the Albany Town Hall.

The main purpose for the establishment of the station was the need for an improved signal level for Albany listeners who were disadvantaged by the distance of some 230 km from 6WA Wagin, at the time transmitting with a power of 10 kW. The signal strength in Albany was deemed to be inadequate for a town of its size, and so an alternative source was provided by installing two Philips transmitters in parallel to give a combined output of 400 watts. In 1983, a new Harris transmitter was installed launching 6AL into the age of all solid state circuitry.

Since 1961, the ABC have operated a local studio in Albany. It is currently located in the Commonwealth Buildings in York Street.



6AL transmitter building.

Included in the service area of 6AL is the Mount Barker district, a well known wine producing centre. Vines were first planted in the area by the Department of Agriculture as an experiment. The conditions proved to be ideal and there are now some 200 hectares of vines in production. Plantagenet Winery was the first winery to be established.

Types of grapes grown include Rhine Riesling, Chardonnay, Traminer and Sauvignon Blanc for white wines, while plantings for reds include Cabernet Sauvignon, Shiraz, Pinot Noir, Malbec and a small amount of Merlot. Three of the most popular white wines are Kings Reserve Traminer, Kings Reserve Chardonnay and Wyjup Rhine Riesling. The Riesling is typical of the district: steely and reserved when young, normally slow developing but with unusual clarity of fruit flavour.

Being part of the Lower Great Southern Agricultural District, the climate is relatively cool, and grapes are normally ready for picking from mid-March through until the last week in April in an average growing year. This makes the Mount Barker region one of the last to pick the grape harvest and apart from the colder areas of Victoria and Tasmania, one of the last in Australia.

One of the surprising features of the wine industry in the area is the large quantity of wine sold through the cellar doors. Even more surprising is the continuous stream of tourists who drop in on their way around Australia by car or tourist bus. The Plantagenet Winery is one of the favourite stopping places for cellar sales and wine tasting, and visitors can spend much time viewing the many awards and trophies collected in Western Australia and Interstate over the years for the great variety of excellent wines from the Mount Barker region.

TED HEWITSON and TOM REED



ABC studio York Street, Albany.



Robert Bowden (L) Winemaker and Ted Hewitson Tech., at Plantagenet Winery.



Plantagenet Winery, Mount Barker.



View of main street Albany.

MR S. H. (SID) WITT

Sidney Herbert Witt, Superintending Engineer, Research Laboratories, resigned from the Postmaster General's Department in 1948 to take up an appointment with the International Frequency Registration Board at the ITU in Geneva, after building up the Laboratories from a one man research organisation, to one of the foremost organisations in telecommunications research in the world.

He was born on 12 March 1892, and attended the Malvern State School in Victoria from 1901 to 1906. He furthered his education by self study, concentrating on Mathematics, Physics, Chemistry and Electrical Engineering subjects which were to become of extreme importance in later life. He was interested in laboratory work from an early age and established his own workshop in which he made several items of scientific apparatus.



Sid Witt.

In 1910, he was appointed a Junior Mechanic in the Postmaster General's Department and promoted to Mechanic in 1912. On 1 December 1913, he was appointed Assistant Engineer Class E in the Victorian administration and in July 1915, transferred to the Chief Engineer's staff in Central Office where he was in charge of the Telephone and Telegraph Equipment Section.

From March 1921 until March 1922, he accompanied Mr F. Golding, Chief Electrical Engineer, on an extensive world trip to study the latest developments in telegraphy, telephony and radio communications. In particular, he made a detailed study of the technical facilities in operation at high power radio transmitting stations in England, USA, France, Italy, Germany and Egypt and discussed the latest technological developments in radio engineering with many eminent engineers and scientists.

In 1923, shortly after his return to Australia he was given the task of establishing the Research Laboratories, and in 1924 was permanently appointed to the position of Supervising Engineer of the Laboratories.

It was at this period that broadcasting commenced in Australia following legislation approved by the Government on 1 August 1923.

With the Postmaster General's Department being responsible for licensing and oversighting the orderly development of broadcasting, it was natural that Mr Witt and the Laboratories should become involved.

Staff were soon busy measuring field strengths of stations on air and developing equipment and practices to enable the telephone network to be used for bringing programs from remote points to the transmitters. In 1925, they designed circuits for the first simultaneous broadcast from six A Class stations, followed in 1927 by a broadcast of the opening of Parliament House, Canberra, by the Duke of York. Mr Witt delivered an address to the Institution of Engineers on the technical details of the project.

The Government of the day was not satisfied with the rate of progress being made in broadcasting, particularly with expansion to country areas by the A Class stations and in 1927, Mr Witt together with some members of his Laboratories staff was seconded to prepare plans for a national service to provide broadcasting reception for at least 90% of the population.

In 1928, the Government introduced legislation to acquire all the A Class stations as part of the plan for establishment of a National Broadcasting Service. Responsibility for planning and the technical aspects were given to the Postmaster General's Department and as a result, Mr Witt and his staff became heavily involved in broadcast engineering planning, design and provisioning activities.

Included among their many activities were soil conductivity and propagation studies; determination of appropriate wavelengths for the service; preparation of transmitter and studio designs, specifications and tender documents; original design work for tall vertical radiators and development of testing and measuring instruments for broadcast purposes.

The first regional station commissioned was 2NC Newcastle in 1930 followed by 4RK Rockhampton, 2CO Corowa and 5CK Crystal Brook. Mr Witt took a very close interest in the establishment of all these stations as they were the first provided by a contractor to Departmental specifications and installed by PMG Department staff.

Soon after the start of the Second World War, the Government decided to establish a high power international broadcasting station operating in the short wave bands and Mr Witt was asked to head the project in planning, designing and commissioning the facilities. It was a task of immense magnitude undertaken during a time when the country's resources were heavily committed to the war effort. The project was satisfactorily commissioned during 1944-45. In addition to the Radio Australia project, he was active on many Boards and Committees dealing with Radar and Radio communications for war purposes.

After the War, he was busily involved in representing Australia at many overseas conferences including Commonwealth Communications Conferences, ITU Conferences and the World Radio Convention. It was at the 1947 World Radio Convention that the framework for establishment of the International Radio Frequency Board was prepared. He was appointed to the Board, and took up duties in 1948. He served the Board until 1954 when he retired, and returned to Australia. Mr Witt died on 28 June 1973 at age 81 years.

JACK ROSS

LIFE SAVING SERVICE

ALIVE VIA SATELLITE

No doubt many readers of The Broadcaster have seen the "Alive by Satellite" commercials on TV. Some of our boat owners probably use the radio beacons shown in these advertisements, bobbing around in the sea, sending out a distress signal which guides the searching helicopter to the hapless sailor in peril of his life.

But, did you know that the Broadcasting Division has a part to play in the provision of this life-saving service? The ground station equipment, or Local User Terminal (LUT), is housed in the VL8A Outback HF Transmitter site 15 km south of Alice Springs.

Passing 1000 km overhead at roughly two hour intervals are five Search and Rescue satellites. Two are Russian and three are American. All are in polar orbit and appear above the Alice Springs horizon for up to 20 minutes as they pass overhead. The LUT is programmed to align one of two flat plane receiver antennas to the correct azimuth and elevation before the satellite appears. As the satellite passes directly in front of the antenna it begins tracking the satellite's path across the sky. Timing for the system uses Omega time reference. The satellite picks up any signals from beacons and relays them to the LUT. The Doppler effect causes signals from beacons being approached to increase and those being left behind to decrease. The point at which the frequency changes is the "point of closest approach" and determines the latitude of the beacon. The distance away from the track of the satellite (longitude) can be estimated from the shape of the frequency graph. The correct longitude can be predicted by allowing for the rotation of the earth and its effect on the Doppler shift pattern.

The LUT does primary processing on site. A map of Australia and the surrounding sea for at least 1500 km off the coast can be displayed together with the current satellite track and positions for any activated beacons. The data is relayed to the Sea Safety Centre in Canberra where further processing is done to improve the accuracy.

So, next time you decide to get away from your work, on your fishing boat or soaring in your glider, remember the equipment located at Alice Springs broadcasting station site will be watching in case you need help. But don't forget to take your beacon.

MURRAY FOPP



Display screen showing track of the satellite and area served around Australia.



Australia's satellite search and rescue system, on VL8A Alice Springs HF broadcasting station site.

BING CROSBY

Bing Crosby is not often heard or seen these days, except perhaps at Christmas when his recording of "White Christmas" is still sold and clings tenaciously to its special position as the largest selling recording of all time. On occasions, Bing might be seen in the depths of the night on television when some of his pictures are given a re-run.

It is difficult for today's young generation to appreciate the enormous popularity he enjoyed for a quarter of a century as one of the leading entertainers in recordings, films and radio from the early 1930's to the 1950's when the increasing spending power of the young caused popular music to take an abrupt turn leading to rock and roll, so forcing the majority of



Bing with an RCA ribbon microphone.

older artists and even the great songwriters of the twenties and thirties, to retire to the backroom.

From the late twenties, Crosby was on the air, first from a small local broadcast station in Los Angeles where entertainers would gather after their commitments in the night clubs, theatres etc., to enjoy themselves and then at the CBS network studio where his weekly variety program, "The Kraft Music Hall" dominated the ratings for most of its ten years, 1936 to 1946.

William S. Paley was just establishing the CBS network and looking for talent when he heard a recording Crosby had made with the Gus Arnheim band while working at Coconut Grove in Los Angeles. Paley brought Bing to New York where he joined others like Morton Downey, the Boswell Sisters, Kate Smith, the Mills Brothers etc. The popularity of radio was increasing so quickly that the film industry set out

to capitalise on it by making a series of "Big Broadcast of . . ." films, of which the Big Broadcast of 1932 starred Bing Crosby.

Early sponsors were Cremo Cigars (made under glass for your sanitary protection) and Woodbury Soap, but it was the "Kraft Music Hall" that established Crosby as the leading personality. It also provided a showcase for his current recordings.

When "The Kraft Music Hall" finished, Crosby commenced a new series, "Philco Radio Time".

The series was sponsored by the Philadelphia Storage Battery Company, which had been in the broadcast receiver manufacturing business producing Philco brand models since 1927. The business was a tremendous success with the company being one of the big three radio manufacturers in the USA, with RCA and Zenith.

His experience in recording transcriptions for the Armed Forces Radio Service and no doubt also for the freedom that it promised him, led Bing to press for the new programs to be electrically transcribed. He was the first major star to pre-record his broadcast programs in this way. There was some trepidation about introducing this technology on the part of both sponsor and the ABC network which broadcast the show. There was some reservation about the



Advertisement of program sponsored by Cremo Cigars.

technical quality. However, the program swamped all current competition and transcriptions came into their own.

During the early days of "Philco Radio Time", another technical revolution was gathering steam. One of the employees of Crosby's business, "Crosby Enterprises" had been with the Occupation Forces in Germany at the end of the War and had seen early tape recorders which Radio Frankfurt was using. He had earlier been intrigued, listening to short wave transmissions from Germany, by what had to be long sessions of recorded music, but which obviously could not be 78 rpm records or even transcriptions and he specifically set out to find out how they had been done. He dismantled and packed some of these captured machines and sent them to his home, together with 50 rolls of magnetic tape. Back home, Crosby Enterprises formed an association with the Ampex Company and the Ampex 200 recorder was the outcome.

The "Philco Radio Time" program of 1st October 1947 became the first ever program to be broadcast from tape in the United States.

So, in addition to his place as one of the all-time great entertainers, Bing Crosby has to be seen as an important innovator in the development of broadcasting technology.

JOHN STARR



Crane truck at base of the tower.



Ross Clugston CO2 dismantling deicing cables on batwing antenna.



Snow scene at the site.

UHF ANTENNA

MOUNT CANOBOLAS

Mount Canobolas, home of television transmitters feeding the Central Tablelands of New South Wales, is the highest peak along the line between the Blue Mountains and the Indian Ocean. The top of the tower is 1585 metres above sea level, making it the Broadcasting Branch's highest in the State. Fifty million years ago, Mt Canobolas was a volcano where five separate vents operated over a long period, each discharging a different type of lava.

The peak is in the 15 square kilometre Canobolas Park which offers impressive views, waterfalls and walks—and, in the spring, a glorious wildflower display.

Orange is the nearest major centre and is an important city known for its apples. The town was named, not after the fruit, but the Prince of Orange. The poet 'Banjo' Paterson was born nearby.

The tower was recently the scene of extensive work including the installation of a UHF antenna, initially for WIN and Capital Television as part of Aggregation plans. It has capability to carry four 30 kW services.

Working on the structure is extremely dangerous during winter months and the build-up of ice on the tower can make it almost impossible to work and even when there is no ice, the weather conditions can change rapidly often making a hasty descent essential.

Because of the extreme cold, workmen have to wear four or five layers of clothing, including thermal underwear and spray jackets. The bulky clothing restricts movements, delaying the progress of work. In order to handle small items such as nuts and bolts it is necessary to take off the gloves and work as quickly as possible before the fingers become numb with the cold.

In order to be forewarned of approaching weather conditions which could affect safety of staff and equipment, daily local forecasts were sent from the Weather Bureau in Sydney. A more informal method of judging changes in the weather was to listen to the radio relay system dishes on the nearby tower. They gave off a high pitched squeal when the wind speed reached 20-25 knots.

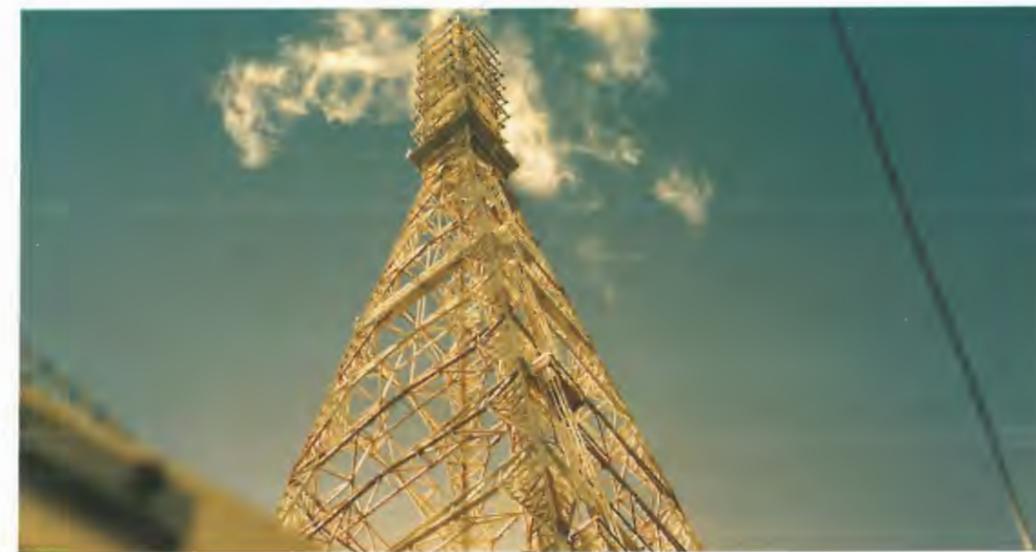
A great deal of work had to be done to strengthen the tower before the antenna which weighed some three and a half tonnes could be installed. Approximately three tonnes of material had to be hoisted up the length of the structure. This included extra bracing which was used for strengthening, lifting steel members which were temporarily installed and then later removed, and a large number of tower grade bolts which had to be replaced by high tensile bolts.

Perhaps one of the greatest trials in the exercise, was the final linking of the antenna to the tower. The antenna had to be hand winched up the last three metres using two six tonne capacity chain block pulleys. The work was so slow that one full pull on the winch raised the load only one millimetre at a time.

Staff worked a thirteen hour day, weather permitting, on a fourteen day roster followed by a two day break.

Workmen even came from interstate depots to help with the project. They came from Queensland and far away Western Australia. Those men who had never experienced snow under working conditions returned home with a greater appreciation of the extreme weather difficulties under which their colleagues in other States often have to work.

**DOUG SMITH and
DARRELL SMITH**



The Mt Canobolas tower showing VHF batwing antenna system.



The UHF antenna being hauled up inside the tower.



Snowy the Snowman takes over the winch.

DOUG McARTHUR

Doug McArthur, Officer-in-Charge, Melbourne and South East District Maintenance Base, Victoria, commenced service with the Postmaster General's Department as a Technician-in-Training in January 1959 and qualified as a Senior Technician in 1964. His first station appointment was Officer-in-Charge 8AL and HF Radio Telephone Terminal, Alice Springs.

In 1967, he moved to Darwin as a Senior Technician for the installation and commissioning of the Radio Australia station and later as a Shift Leader when the station commenced operation.

Following cyclone "Tracy", he transferred to Radio Branch, Melbourne where, as a STO3 supervised the National Equipment Standards Type Testing Laboratories.

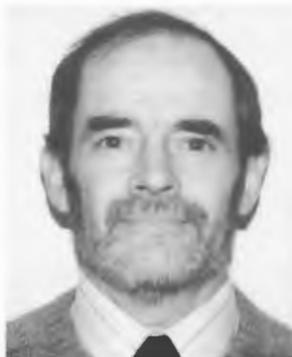
From 1981-1983, he was based in Jeddah, Kingdom of Saudi Arabia with their Ministry of Foreign Affairs, as Project Manager for the International Telecommunication Union.

In January, 1989 he returned to the Broadcasting Directorate and occupies the position indicated above.

Doug is married, with a daughter and a married son. Hobbies include umpiring both State softball and baseball, having in the past, represented on many occasions both SA and the NT.



Doug McArthur



Jim Brown-Sarre

JIM BROWN-SARRE

Jim Brown-Sarre, STO3, Officer-in-Charge, Mt. Baranduda Broadcasting District, Victoria, joined the Postmaster General's Department in 1952 as Technician-in-Training. On completion of training he worked at the Broadcast No. 2 Installation Depot at Brunswick, where part of the duties involved maintaining the original Melbourne FM station at Jolimont.

He then transferred to the metropolitan transmitters 3AR/3LO Sydenham, and in 1961, obtained an appointment as Senior Technician at that station. The next move was to ABMV4 TV at Mildura as a Shift Leader and finally STO2 Officer-in-Charge until the end of 1986.

A complete change from the hot dry inland was achieved with his next appointment as Officer-in-Charge of the Mt. Baranduda TV Station at Wodonga—now the Mt. Baranduda Broadcasting District Maintenance Base.

Jim and his wife Aileen have three children, a son still at home and two married daughters in Mildura and Melbourne. They are kept busy visiting five

grandchildren, sailing on Lake Hume and bushwalking.

JOHN ARTZ

John Artz, Officer-in-Charge of the North West Broadcasting District, commenced his career in the Postmaster General's Department as a Technician-in-Training at the Ballarat Training School in 1962.

During his training, he attended all the usual variety of places that trainees did. He was one of the last trainees who had a stint at the Melbourne ABC Radio, William Street Studios. He was first appointed as Technician on Radio Communications Installation where he worked on the first Melbourne to Adelaide GEC Link. He then transferred to the National Television Transmitters at Goschen (Swan Hill) as a Technician on shift. He later qualified as Technical Officer and was appointed to Mt. Alexander TV, Bendigo for a short time only, as he received a promotion back to Goschen TV.

In later years, he was involved with the installation of the ABC FM radio service and the conversion to automatic and remote operation of the station. With the introduction of Districts in 1988, he was promoted to STO3 in charge of the North West Broadcasting District.

He is married and has two adult children, his son recently qualified as a Pharmacist and his daughter is doing Teacher Training. In his spare time he enjoys a game of golf and caravanning with his family.



John Artz



Rod McKinnon

ROD McKINNON

Rod McKinnon, Officer-in-Charge, South West District, Victoria, joined the Postmaster General's Department in South Australia as a Technician-in-Training in 1959. He was allocated to the Radio Section and on the completion of his training, worked at the ABC Radio Studios in Adelaide before they were transferred to the ABC.

Rod worked as Senior Technician at station 5MG Mt. Gambier for two years before moving to the Adelaide Broadcasting Installation Depot. There he was involved with various television and radio installation projects including the installation of television transmitters at Loxton and Darwin.

On completion of the Darwin installation, Rod worked as OIC of the Darwin Radio Group whose activities included the maintenance of TV and AM broadcast transmitters, microwave and tropospheric scatter microwave communications systems.

During 1975, Rod accepted an appointment as TO2 Shift Leader at ABMV4 Mildura and worked in this position for five years. He then acted as STO2 OIC Lookout Hill TV, and was appointed to this position in 1981.

LOCAL ASSEMBLY AND TESTING

NEC Australia Pty Ltd is well known to readers of *The Broadcaster* as one of the major suppliers in Australia of broadcasting systems and equipment as well as products and systems for the home such as television receivers, tape recorders, colour cassette VTR, hi-fi audio systems etc.

The parent company NEC, Nippon Electric Co Ltd in Japan, is a pioneer in the field of radio and television broadcasting technology producing a wide range of systems and equipment in addition to a host of other major electronics systems and facilities.

The company has been involved in the design and manufacture of broadcast transmitters as far back as 1934 when it manufactured a 100 kW transmitter for a station in Manchuria followed by a similar model for Taiwan.

NEC Australia is the largest supplier of FM transmitters in Australia, and in the 1987/88 sales period, had a 95% share of the market. When they supplied a 20 kW transmitter for 2MMM-FM Sydney it was the 300th FM transmitter supplied by the company. Many of the transmitters associated with the ABC-FM Stereo service installed and operated by the Broadcasting Division were also manufactured by NEC.

Traditionally, NEC FM transmitters have been fully manufactured, assembled and factory tested in Japan with delivery time of six to seven months.

NEC Australia recently expanded its Mulgrave Broadcast Engineering Centre near Melbourne to provide for 10 kW and 20 kW FM transmitters to be locally assembled from imported sub-units and components, and locally sourced items.

This requires a substantial amount of engineering input and the local company technical staff have developed a high level of expertise in FM transmitter engineering.

With assembly and proof-of-performance testing now being performed in Australia, NEC is able to provide a short delivery time—as short as two weeks ex-factory. Additionally, the transmitters can be prepared to meet specific system configurations and specifications.

The location of the assembly and testing facility near Melbourne makes it very convenient for purchasers to participate in the factory acceptance testing and for operating and maintenance staff to attend training courses conducted by the company. The ready availability of spare parts for the transmitters means that there is no need for a large store of components to be held at the station. One of the features of the tuning and testing area is the provision of a screened room large enough to accommodate transmitters up to 30 kW output power. The screened room ensures that the operation of the transmitters during testing phases does not result in electro-magnetic interference with equipment, particularly TV and radio receivers in the area.

In addition to FM transmitters, the company has supplied many of the Commercial and National stations with TV transmitters. The current solid state VHF and UHF models are widely employed. The VHF models are available in 5/10/15/20 and 30 kW units while the PCU-900 SSW UHF series has transmitters in the power range 5/10/20/30 and 40 kW. There has been heavy demand for these transmitters with expansion of services resulting from aggregated regional TV markets.

ROGER GREENWOOD



Dual 10 kW FM transmitter in screened test room.

NATIONAL OFFICE

The Engineering Services Section has experienced a number of changes recently with long term consultants Brian Clements and John Reeve, both Mechanical Engineers, along with David Lim, Electrical Engineer, and Don Davis, Structural Draftsperson, being recent additions. Engineer Class 3 Jenny Datskevich was recently appointed to the permanent staff while Engineer Class 2 Milan Delac has been promoted to Telecom Property Services.

The Finance, Accounting & Supply Branch has lost Garry Kyriacou to Operator Assisted Products Branch and Gladys Cendak to Corporate Customer Division while new acquisitions include Admin Officer 6 Alan Richards from the Kerry Packer Group, Engineer Class 3 Peter Ciblis from the Road Traffic Authority, Admin Officer 3 Pam Thompson from TNE Tasmania and Finance Officer AO3 Lisa Cutler from Broadcasting Region Victoria and Tasmania.

In the Development Branch, Hugh Murray has been seconded to the ABC for 6 months, Tony Magris has transferred to Broadcasting Region Vic/Tas while Engineer Class 3 Abe Azjenman has been promoted to Telecom Mobile Services. Karina Ishak has recently been welcomed to John Webb's Projects B Section as an Engineer Class 3.

VICTORIA

Kate Prior, Drafting Assistant recently joined the Drafting Group and along with Admin Officers Debra Long-Rooks and Jane Gration are welcomed to the Branch. Welcome also to Gary Bourke in the Lines Group and from the National Office, Joe Raffoul and Tony Magris who have joined the Engineering and Construction Section.

Radio Australia Shepparton has seen the retirement due to invalidity of two long serving staff. Dick Maag who came from the ABC studios in South Australia in the late 50's and made a friend with everyone he met will now be able to spend more time outdoors to his enjoyment. Ken Mackie, who commenced at RA in the mid 60's, has not been in the best of health for a number of years and is looking forward to playing more often in the City of Shepparton Pipe Band along with his wife, the Pipe Major. Good luck and best wishes on your retirements.

QUEENSLAND

The Radio Lines group has seen a number of changes recently with the commencement of David Wright and Brian Flintoff, and the resignations of Ken Heap and Daryl Gardener.

Recent arrivals to the Branch also include Philip Reeves AO1, Jacqui Fuller AO2, our Miss Telecom Entrant in the Miss Australia Quest, and John Paul Hayden STO2.

Mark Bagdonas AO2, has been temporarily transferred to H R Systems where he is acting as AO3.

Brian Cleary BOM and Graeme Offer AO3 have joined the European Jet Setters Club.

Many staff have celebrated additions to the family including Craig Haines and wife Karen, Michael Collins and wife Anne and Chris Russell and wife Felicity. Congratulations to all. State Broadcasting Manager Allan Garner and wife Gay became proud grandparents for the first time. Mother and daughter

are coping well, but grandpa is wondering what he is in for now.

NEW SOUTH WALES

Recent arrivals to the Branch have included Sharon Dorsett and Joanne Trower who have commenced with the happy group of the clerical area.

Joy Lee has settled in with the Radio Lines group on clerical duties and is coping well with this hard working group who seem to spend more time at far away places than in the depot. They recently completed a number of major projects including one at Mount Canobolas where they had to work amongst the snow and bitterly cold winds. Good work boys.

TASMANIA

Roger Gascoigne who was the Branch Costing and General Officer, completed his fixed term of employment with the Branch on 18 May. Many thanks Roger for your contribution and we wish you well for the future.

There have been a number of visits from Victoria following the establishment of the Vic/Tas Region and these have included Radio Lines and Electrical Fitters on various projects. It has been apparent that they enjoyed their visits and we hope to see them again in the near future.

WESTERN AUSTRALIA

Henry (Dick) Suhr, Communications Officer, Radio Australia, Carnarvon, retired after 12 years service. Dick does not intend to retire completely, as he has headed for Katherine to help in his son-in-law's business.

Others who left the Branch were, Frank Vandevelde, Communications Officer, and Margaret Stephens, Registry Officer.

New technical staff include Peter Provan and Darren Dell at the Technical Centre and Trevor Mosel at Radio Australia, Carnarvon. The Engineering and Construction Section has been strengthened by Bill Kriewaldt, Craig Lamb and Andrew Drakely joining as Communications Officers and Carey Adams as Draftsperson.

SOUTH AUSTRALIA/NORTHERN TERRITORY

Jerome van der Linden, Finance Section, is on 12 months posting to Riyadh, Saudi Arabia and Denis Collins is on duty in Sri Lanka until end of July.

New arrivals to the Branch are, Colin Burk STTO1 at 5LN, Raymond Hunter CO3 with NT Radio Lines group and Kevin Jeffrey TTO1 Radio Australia, Darwin, ex Rockhampton.

Ron Warner, Draftsperson, retired after many years of sterling service and Peter Harris, TTO2, The Bluff also retired.

To mark the 25th anniversary of establishment of The Bluff TV station, a ceremony was held at the station at which Ted McGrath former Supervising Engineer, Radio unveiled a plaque. Many people associated with the initial establishment were in attendance.

ANTENNA TEST RANGE

In May last year, I was part of a small team representing the Division at SIRA in Italy where I had the opportunity of studying work and testing practices at their well equipped factory and to see an installation in the field.

SIRA is a technically based operation where they design and assemble components that have been made to their specification by sub-contractors. Office, factory and test range are all on the same site at Caponago which is approximately three quarters of an hour's drive from Milan.



Rotator with FM panels mounted for Canadian Broadcasting Corporation at SIRA factory.

Natural light is a prominent feature in their new building to help reduce costs and minimise the use of valuable resources.

Components delivered from the sub-contractors enter the works via the quality assurance area. When they are approved as being to specification they are sent to the storage area pending assembly.

After assembly, antennas are taken to the adjoining test range which has two rotators. The two units allow testing to be undertaken with one unit while the other

is being set up with another system. The transmit signal is emitted from a telescopic mast on top of the test recording building.

Between the test range and the factory is an open paved area where the full antenna can be assembled for impedance measurement and adjustment.

The high gain arrays are assembled on a square column with internal power feed systems and the option of hinged panels.

One of these arrays was accessed at Schöckl in Austria, the main transmitting site for Gratz. The tower was only of medium height but carried massive loads, by Australian standards, as a telecommunications site.

On top was a 16 level four sided UHF array, followed by four levels of Band III VHF panels, then six levels of multi FM Band II panels. Radio-communication microwave equipment in the form of very large dishes and horn antennas occupied four massive platforms in the bottom section of the tower. Next to the tower and level with the bottom platform was a very large portal structure carrying 20-30 more dishes etc.



Internal view of four sided UHF array at Schöckl, Austria.

While in Italy, many Australian options were discussed and alternatives agreed to with SIRA. Some of these included increasing the grade of stainless steel used to 316, the repositioning of internal components within the column to maximise access and construction methods of their hinges.

It was interesting to observe how others approach antenna design problems and to compare their methods and techniques with Telecom Broadcasting Division practices.

GARY FRANCE

CHAMPION CANOEIST

Rene Mol, Fitter and Turner with the Engineering Services Group at Radio Australia Shepparton, began canoeing in 1977 and by 1981-82 was breaking records in the annual Murray River Marathon as well as representing Australia in international events.

The Murray River Marathon commences at Yarrawonga and finishes four days later at Swan Hill, a distance of 400 kilometres. In his first attempt at the marathon, Rene came third. In subsequent years however, he won the kayak singles four years in a row between 1979-82 and broke records in three of those years.

In international events, Rene won two Australian marathon titles and Commonwealth championships in the 10,000 metres and marathon on the Brisbane River during the 1982 Commonwealth Games, then was fifth in the world pairs title with Jim Sloane from Albury in Berlin in 1982.



Rene Mol in training.

Rene was second in the Sele Descent near Bilbao, Spain and he and Jim Sloane set a record for the two day international race on the Firth of Tay, near Dundee, Scotland.

After these successes he then had a break from canoeing for six years.

On moving to Shepparton in 1989 from the LaTrobe Valley, Rene found the warmer climate and the ready availability of the Goulburn River and Lake Victoria to his liking and the urge to race again was soon revived.

One of Rene's first races in his comeback was in the open kayak K1 event of the Echuca Red Cross mini-marathon. He broke away from the Seoul Olympics bronze medallist, Paul Gilmore about an hour from home and won the race by a hefty three minute margin.

Rene recently journeyed to Western Australia for the Australian Kayak Championship held on the Murray and Serpentine Rivers south of Perth over the Easter holidays.

With water conditions not to his liking he finished fifth in the doubles and eighth in the singles event, both over 42 km.

Next year the championship will be held in Sydney on the Georges River and he hopes that the deeper water conditions may suit him better.

RAY WEEKS

IRON TRIANGLE CITIES RECEIVE TWO FM SERVICES

The South Australian cities of Port Pirie, Port Augusta and Whyalla in the mid-north of the State comprise what is known as the Iron Triangle. For years, the residents endured a form of FM or cultural starvation, whilst other people throughout the nation had come to expect the full range of ABC services as a natural way of life. All this was put right late last year with the commissioning of two FM transmitters.

Port Pirie has a population in excess of 12,000 and is an industrial centre-port with mineral treatment plants and bulk grain handling facility. The BHP lead smelters form the largest industrial complex.

Port Augusta is a major railway workshop and electricity power generating centre. It has a population approaching 15,000.

Whyalla has a population of about 31,000 and is a large industrial centre with the BHP steelworks being the major industry.

Like some other major centres, the introduction of ABC FM services had for years been delayed because of problems in clearing certain operational TV channels to allow the FM transmitters to be allocated appropriate frequencies. The presence of Channel 4 at Port Pirie was a problem, but it was made worse by the presence of Channels 3 and 5 services on the West Coast near Port Lincoln. The clearance of these latter channels in late 1989 cleared the way for the introduction of two high power FM services at The Bluff near Port Pirie, the home of TV National Service ABNS1 since April 1965, and Commercial Service GTS4 since March 1968.

Although Channel 4 still remains operational, it was possible to select two FM frequencies which could live happily with Channel 4 for the time being. In the long term, plans will see the departure of Channel 4 and a resulting reallocation of two FM frequencies along with the introduction of other services.

Because of the interim nature of the two transmit frequencies, and the unavailability of suitable space on the tower, decision was made to use a four bay circularly polarised high power omnidirectional aerial system, side mounted to one of the tower legs. The aerial is a Shively 6814/4 system.

The transmitters, combiner, feeder and program input parts of the system are fairly conventional being respectively two NEC 11K20E 20 kW transmitters, an RFS two input service resonator combiner, 3-1/8 inch CUZY feeder and HACBSS satellite and associated input equipment for program sourcing.

Installation of the external plant was not without its difficulties. Line staff had to cut a trench through solid rock as part of their operations. The lifting and fixing of the 10 m long aerial and the feeders were handled with what appeared to be a straight forward operation for these experienced members of the Branch.

Although there was some concern about what effect the large steel tower might have on the field strength pattern of the aerial, reports and extensive field measurement revealed excellent coverage of the Iron Triangle area. The residents and travellers in the area are now enjoying the brilliance and clarity of a radio service that only FM can provide.

TOM PASCOE

LIGHTNING DAMAGE

ABNT3—MT. BARROW

On October 1st last year, a massive lightning stroke hit the ABNT3 tower at Mt. Barrow in Northern Tasmania. The stroke caused considerable damage to the uppermost level of the antenna system and started a fire in the timber and fibreglass radome structure. The fire destroyed the fibreglass top hat and most of the top level of skin panels on the cylindrical section of the radome.

The top cantilever support structure comprising eight box-section timber radials was almost destroyed. A number of timber vertical members and bow-string ties were also destroyed. Severe scorching occurred at several other places inside the radome, most notably at the base where burning debris from the top section fell, igniting timber and fibreglass components.

Fortunately, the fire did not reach self-sustaining point, and ultimately extinguished itself, leaving about 90 per cent of the radome structurally intact.

Following the stroke, the station operated on the lower half of the antenna at reduced power. ERP for television was 5 dB below normal and 10 dB below normal for the FM service.

Clean-up operations were made difficult by bad weather conditions. High winds, snow and ice formation on site lasted for some time. The radome deteriorated badly during this time with some top panels collapsing and the whole structure placed under high stress. No climbing was possible for a whole week at one stage.

Early action included removal of the level 6 antenna stack, trimming the radome cylinder down to just below level 6 and construction of a new roof out of timber at that point, leaving about 3.5 metres of tower section above the reduced radome.

In addition to sterling work by local Tasmanian staff, linestaff were brought in from South Australia to assist with construction of the new radome roof and other works, the Radio Australia Shepparton turner and fitter modified the power divider and officers from National Office also participated.

BRIAN HEY



Radome (Left) as seen from aircraft.



Damaged fibreglass on radome top.



Radome as seen from the ground.



Charred timber inside radome.

STRUCTURAL WORK

RADIO LINES—ENGINEERING SERVICES SUPPORT

On recent projects, a new approach for Telecom has been tried, tested and proven. This is to actively encourage interaction directly between the external lines area of Broadcasting and the Structures group of Engineering Services Section, National Office. The approach is an extension of the "Radio Lines Construction Practices TPH 2668" when applied to non-standard erection procedures.

At the commencement of an unusual project, erection practices, including rigging equipment, are broadly evolved by the lines area, then checked for structural adequacy by Engineering Services. A final approach evolves by discussion between the two parties to ensure that all requirements are fully met.

In this way, the lines area is responsible for the rigging that they have to work with and can design the approach around available equipment and/or people's experience and be confident that the system is structurally adequate and will not cause any overload to the rig or the structure.

Initially, the approach was trialled on several relatively small but different projects. One was at Mawson in Western Australia where a four level array of UHF panels was erected on top of a 180 m mast using an externally mounted jury. The work was carried out by Broadcasts Lines WA led by A. Johnson (CO6). Another project was at Borthwick Hill

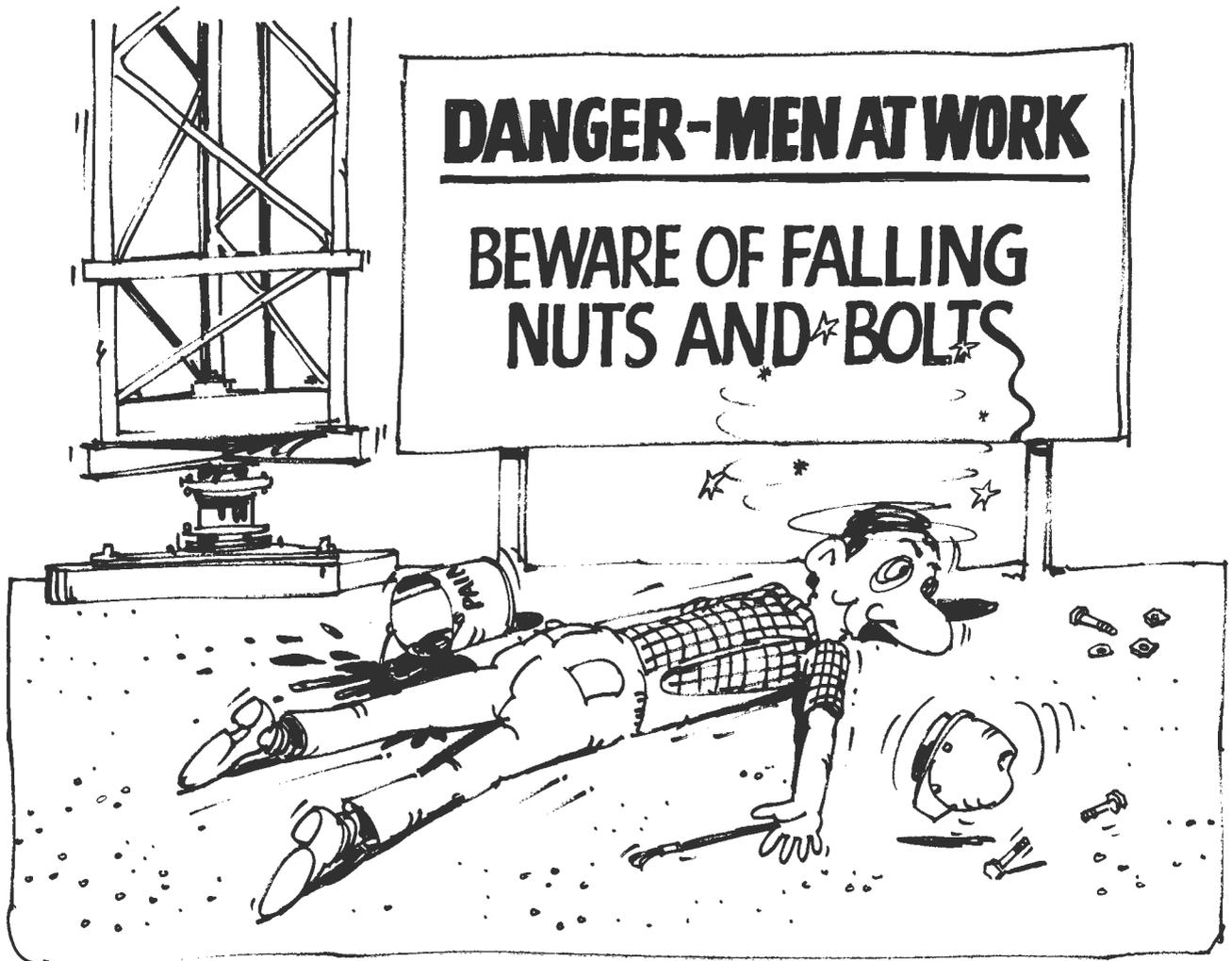
in South Australia where the crews were led by A. Wissenburg (CO6) and J. Finch (CO6). This project involved the placement of a six level UHF array on top of a 122 m mast using external juries. The array was lifted in two pieces with masses of 720 kg and 420 kg.

Recently, a 10 level SIRA UHF antenna was erected at Mt. Canobolas, Orange in New South Wales by the local Broadcast Lines staff lead by D. Hume (CO6) and D. Smith (CO5). This lift was unusual in that the antenna was lifted up the centre of the tower and moved horizontally into position by the use of a crab on rails at the top of the existing tower. This lift was 14 m in length with a mass of 3800 kg. The importance in planning the operation was demonstrated on the day when the lift and positioning, helped by a spot-on weather forecast, went without a hitch. The day finished with a very pleasant BBQ and "bull dust session".

The Mt. Canobolas antenna is a rather high power array that is capable of taking four 30 kW UHF services into full or half stack. It has double input connectors to one face of panels, putting twice the power to this face. To cope with the power, the panels are fed by 7/8 inch diameter Flexwell cables whereas the incoming rigid line to the antenna are two 4-1/8 inch diameter. These are fed by two 6-1/8 inch diameter Flexwell cables up the tower to the U links.

These were very successfully completed projects and should be the forerunners to many more where Broadcast Lines staff are utilised for the more interesting novel and challenging tasks of building a high level of expertise within the Division. Well done.

GARY FRANCE



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,

Readers of The Broadcaster may be interested in the photograph taken on the opening night of the first NBS regional transmitter in South Australia, 5CK Crystal Brook which commenced regular transmission on 15 March, 1932.

The photograph was taken by W.S (Bill) Whisson, Supervising Technician in charge of installation and the first O.I.C. of the station.

The equipment was installed by PMG technical staff (then known as "Mechanics Grade 2"), under the general guidance of an STC installation engineer. The whole project was under the control of Frank O'Grady, Transmission Engineer assisted by Laurie Billin, Engineer Class "E".



Back Row, Left to Right

F.W. (Jock) Anders, Shift Technician; E.P. (Ted) McGrath, Shift Technician; L.C.A. (Len) Cooper, Shift Technician; C.A. (Chris) Comas, Shift Technician; L.C.E. (Laurie) Billin, Engineer, Transmission Section Adelaide

Front Row, Left to Right

C. McQuillan, Line-up Engineer, STC London; C.H. Benson, Divisional Engineer, PMG Wallaroo; S.H. Witt, Supervising Engineer, PMG Research; P.J. Kennedy, Superintending Engineer, PMG Adelaide; F.P. O'Grady, Transmission Engineer, PMG Adelaide

Installation was under way by June 1931 when the staff consisted of Bill Whisson, Jock Anders, Chris Comas, and Ted McGrath with some valuable help from local and City linesmen. J.G. (George) Ramsay from the PMG Telegraph Workshops came up later to help with the heavy blacksmith type work and the never-ending waterpipe thread cutting for cooling and exhaust systems.

Besides the considerable diversity of activities inside the building the installation staff also dug part of the trenches for the extensive "fishbone" type earth mat and constructed the multiple-tuned aerial system.

There were no portable electric arc welders available in those days, and all steel members were either bolted or rivetted and all holes therefore drilled tediously by hand. Soldering was done with solid copper soldering irons heated by kerosene blow lamps. No electrical aids could have been used anyhow, in the early stages, as no mains power was connected to the station for some months.

When the station opened, the installation staff had been augmented by the arrival of Len Cooper and each of the two shifts consisted of two operators, one manned the shielded speech-input room and the other kept an eye on the transmitter. Communications between the city studios and 5CK was by means of a Morse order-wire

and staff who had passed the departmental Morse Code test were paid an additional £12 per year for this qualification.

About a fortnight before the actual opening date, STC line-up engineer C. McQuillan who had taken over from Keith Thow, started test transmissions and sent a Souvenir Card of Test Transmission to all who sent in a report.

After the opening night transmission had finished, STC provided a sumptuous supper for all those present and each of the technicians was presented with an engraved silver propelling pencil from the firm.



Station building during erection 1931.

The last mile or so of the access road from Crystal Brook where the staff lived, consisted of a three chain wide stock route and in the winter and after heavy rain was a hazardous, slippery morass in which many a visiting official and others became firmly bogged and finished the journey to the station on foot. There were plenty of thrills and a few spills especially going home after the late shift on a wet night. It was a long time before conditions improved. Model T Fords could manage it well, motor bikes were OK with care, but other motor vehicles often had trouble.

The original operating staff used motor bikes, Model T Ford, push bike and one sometimes arrived on horseback. This latter means of transport rattled the Costing Section which finally decided that a horse was really a push bike and paid him that allowance whether he rode his push bike or his horse.

The writer stayed on at 5CK for a further three months after the opening, and then returned to the Transmission Section, Adelaide. It had been a great experience for all concerned with the project, it was "State-of-the-Art" equipment, we were a happy bunch and although we had been given many tasks well outside the normal duties of a technician, we were all young and didn't mind at all.

TED McGRATH

Sir,

Bruce Wilson's reference in The Broadcaster, November 1989 about the RCA 50 kW transmitter still working satisfactorily at Shepparton after 45 years, shows that a well maintained valve transmitter has a very long life.

VLQ, the STC A880A with a 10 kW water cooled final at Bald Hills, was manufactured in Sydney in 1942, went on air in February 1943, and although in recent times has been available for standby service only, is still an operable unit. During its 47 years, it has given excellent service, and when the supply of SS1971 final tubes dried up, it used the 3Q211E, a modern equivalent.

This transmitter, believed to be now the only one in existence, is the show piece of the fine collection of transmitters at Bald Hills, surely the most comprehensive group in this country. There are eight different types installed plus the venerable Philips 1648 from 4SO, now held as a museum item.

DOUG SANDERSON

BROADCASTING MILESTONES

5CK CRYSTAL BROOK

Station 5CK Crystal Brook was the first Regional station of the National Broadcasting Service in South Australia and was commissioned on 15 March 1932. It was officially opened at 8 p.m. by the Hon. J.E. Fenton M.H.R. Postmaster General in a speech from Canberra.



Tower foundation and building erection 1931.

The transmitter was housed in a building with a tiled roof. The tiles were later replaced with asbestos cement sheeting. The building was of wooden frame construction with external weatherboards and internal Tentest covering throughout.

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The transmitter was manufactured by Standard Telephones and Cables and installed under the supervision of the company engineers. It was designed to put 7000 watts of unmodulated radio frequency power into the antenna and to provide a means of modulating the carrier 90% with low distortion.

The equipment in the transmitter proper was mounted on and behind polished slate panels, on the front of which the important controls were located, together with meters.

Motor generating sets were provided to supply power for filaments of tubes, grid bias and plate supply for the RF tubes up to the modulated amplifier. Plate supply of 12,000 volts for the last stage of the transmitter employed a three phase half wave rectifier using water cooled tubes.

The tubes of the final power amplifier were cooled by rain water circulating around their plates, as were also the three rectifier tubes in the 12,000 V rectifier.

The antenna system was a three lead multiple tuned flat top system. It was supported by two lattice steel towers 55 m high and spaced 110 m apart. The system is now used as a standby antenna.

About 1949, consideration was given to the replacement of the transmitter with a 10 kW main and 2 kW standby unit. A new AWA transmitter was subsequently ordered and tested during February 1952. It was officially placed in service on 29 March.

In 1959, a contract was let for the erection of a 190 metre high sectionalised antifading radiator to improve the service area of the station. It was put into service on 4 February 1962.

Further changes to the transmitting equipment were made on 17 June 1966 when the AWA 10 kW/2 kW transmitter was replaced by two STC 5 kW units operating in a parallel mode.

BRIAN BEYER



Present 5CK transmitter.