



# When I Think Back..

by Neville Williams

## George Cookson: from breadcarter to AWA communications engineer

**A letter from a reader in Toowoomba, Qld, serves as a reminder that, behind the big-name pioneers that dominate the history of electronic technology, many others have worked faithfully in the background to translate ambitious plans into practical results. Other letters to hand supplement recent references to Professor Ambrose Fleming and to Newcastle electronic organ builder Alan Bourne.**

The Queensland reader, Len Cookson, says that his father the late J.G. (George) Cookson was deeply involved, amongst other things, in AWA's early transmitting activities at Pennant Hills, Sydney, in the pioneer broadcast station 2FC, and in updating the New Zealand Broadcasting Board's well known 'YA' transmitters, circa 1934. For good measure, he supervised AWA equipment installation in the huge postwar HF transmitting centre at Doonside.

Like father, like son. Len himself spent most of his working life with AWA, Sydney, from 1934 to 1977 — with 32 of those years spent at the radioelectric works at Ashfield and the remaining 11 at North Ryde.

While I was also employed for a time at AWA Ashfield and at their Head Office in Sydney during the mid 1930s, I'm not aware of having met either Len or his father, although our paths could well have crossed in the course of everyday activities.

According to Len, his father, George Cookson, was born in 1887, the eldest of five sons of a wheat farmer at **Dumbalk**, South Gippsland, Vic, who helped support his growing family by erecting fences and building local roads and bridges — in his spare time!

On leaving school, George looked around for a less laborious way of earning a living. Half in jest, the manager of a nearby butter factory offered him a job — provided he turned up on the doorstep first thing next morning. George did just that and was given the position.

From making butter, George later became a breadcarter and subsequently married. It was about then that he noticed a magazine advertisement for ICS

— the International Correspondence Schools, based in most Australasian capitals.

I remember their adverts in the old days, challenging readers to question whether they were being paid what they were really worth; to consider their aptitude and potential in one of more than 50 possible occupations, and to write for a free illustrated booklet.

As a magazine editor, I used to position the adverts in the layout 'dummy' every month, wondering occasionally how many readers really did write in and really *were* rewarded in the long run with a fatter pay cheque.

### Wireless engineer

In fact, encouraged by his mother, George Cookson did write in, did work methodically through the study papers and did end up with an ICS certificate as a fledgling wireless engineer. It was then 1917 and, at that point in time, he joined the Royal Australian Navy and was posted to the coastal wireless telegraph station at Townsville, transferring later to Cooktown.

Len recalls that the family moved to join his father at Cooktown, travelling on the Japanese coastal freighter *Nikki Maru*. When cutlery consistently disappeared from the Cookson table during the voyage, the family was placed under surveillance for possible pilfering. Len himself proved to be the culprit, being caught red-handed hiding cutlery in a crack in the wall!

At Cooktown, his father was a busy man, running the telegraph station and at other times maintaining and operating the projectors at the local once-a-week picture show. In this context, the family was highly supportive of his

hard-won technical skills, because they were admitted into the 'flicks' free!

Nothing if not versatile, George Cookson was also a lay preacher, leading church services from time to time in the Cooktown area.

After the war, he stayed on with the Coastal Radio Service, which was by then in the process of reverting to civilian control. In due course, he was transferred to the main communications complex at Pennant Hills, on the north-western fringe of Sydney, with the family taking up residence in nearby Carlingford.

In those days, the area was distinctly rural and part of the food bowl for a much smaller City of Sydney (see picture). The transmitting site was far enough west to be out of the built-up area, and sufficiently remote from the ocean to form an improbable target for any hostile warship standing off the coast.

Two large poultry farms occupied the land adjacent to the transmitting site. Dairies, orchards and market gardens were scattered around the nearby hills, while a bullock-drawn timber wagon hauled logs and sawn timber past the Cookson house to and from a nearby timber mill.

Today, I am writing this article within walking distance of this very same area, now occupied by thousands of typical red-roofed Sydney suburban cottages. Gone are the dairies, the orchards, the farms and the aerial masts which once pierced the skyline. Buses, trucks and cars jostle the roads once traversed by bullock wagons. The suburban sprawl has transformed it into just another segment of what country dwellers used to call 'the big smoke'.



*The Coastal Radio Service transmitting station at Pennant Hills, around 1930. (Courtesy Len Cookson)*

## Beginnings

But back around 1910, a tender for the erection of a coastal service radio station at remote Pennant Hills, plus a companion station at **Applecross**, WA, had been accepted by the Government of the day from Father Shaw's **Australian Wireless** Company.

Costing 4159 pounds apiece, the stations were destined to be the most powerful in the southern hemisphere. They would use **Telefunken** quenched-gap spark transmitters, feeding aerials supported by a central **400ft** (120m) vertical tower, and powered by a diesel engine of **60hp** or more, driving a **500Hz** alternator.

After sundry delays and arguments, the stations duly opened in **Aug/Sept** 1912. In terms of actual circuitry, the transmitters and receivers were elementary in the extreme but, with a spark gap set for breakdown at **60kV** and an aerial power of around **8kW**, the voltages present demanded state-of-the-art installation and maintenance. Transmissions were possible in the range 300 — 3500 metres.

In 1917, a locally produced **Poulsen** arc transmitter was installed at Pennant Hills, making possible telephony transmission for the first time. Valve transmitters and valve receivers made their appearance in the coastal service from about 1919. (Ref. **A.S.McDonald**: 'A Quarter Century of Radio Engineering in Australia', IRE Convention, 1938).

In 1922, the Federal Government acquired a majority holding in AWA and, amongst other things, commissioned the company to assume formal responsibility for the operation of the coastal radio stations (Ref: **P.Geeves**: *EA*, April 1989, p.47).

It was about then that George Cookson was sent to Pennant Hills as a resident engineer. Apart from normal on-site maintenance, the staff at the station also built and repaired other equipment, including high-powered transmitters.

As if that wasn't enough, Len Cookson recalls that his father spent much of his spare time building and experimenting with receivers in his own workshop.

## At Willoughby

From Pennant Hills, George Cookson

— plus family — was transferred to Willoughby, on Sydney's inner north shore, as resident engineer for the City's new and powerful pioneer broadcast transmitter, **2FC**.

Planning for the new station had been publicised in an article 'The First Big Broadcasting Station in Australasia' in the *Australasian Wireless Review* for September 1923.

Backed by the Sydney department store Farmer & Co, the studio was to be installed by AWA on the roof of their city store. The actual transmitter would have a power input of 5000 watts, compared with the 5-10 watts commonly used by privately owned experimental stations of the day. According to the article, its nominal range would be around 400-500 miles (**600-800km**), but the signal would most likely be heard at night right across Australia.

The station was officially opened on January 10, 1924, although transmissions had actually begun during the previous month. It was something of an exception in being allocated a channel

in the long-wave band, on 1100 metres (273kHz). In *Wireless Weekly* for August 13, 1926, which I happen to have on hand, all other stations listed in the program section were in the current medium-wave band.

In *Wireless Weekly* for July 29, 1927, however, 2FC's wavelength is quoted as 442 metres (678kHz) — not too far from its present 576kHz. It would have been during this interval that my own father and his country wireless cronies got to stripping turns off their plug-in honeycomb coils, following 2FC down in wavelength and up in frequency.

My correspondent, Len Cookson, recalls that 2FC's transmitter had been set up on the site of an old dairy at the corner of First Avenue and Edinburgh Rd, Willoughby (Sydney) on the edge of what is today fashionable Castlecrag. Signals were conveyed to it by landline from the studio atop Farmers department store, on the corner of George and Market Sts, Sydney.

The Cookson family occupied the other half of the building which housed the transmitter, so that his father was very much on-call in the event of trouble. At the rear of the property was a large shed which was used for testing and experimental purposes, principally by another AWA engineer, Sydney Newman, pictured in the article by Philip Geeves in *EA* for April 1989, p.48.

In conversation, Len Cookson alerted me to the fact that the same S.M. Newman had recently written a letter to the editor of *EA*, published in the July 1989 issue, and that he lived at Waitara — only a phone call away. This proved to be the case and I caught up with him one afternoon as he returned from his tri-weekly game of bowls — at the venerable age of 92!

Syd Newman told me that, following an assignment to the British Marconi Co, he had been installed at the Willoughby centre by AWA to develop local short-wave communications equipment, some of which had been used in the England/Australia tests conducted by Ernest Fisk. It was at Willoughby that he first met Len Cookson, who was responsible for the 2FC transmitter.

Yes, Syd had been one of the historic amateur broadcasters in the Melbourne area in the early 1920s. And, yes, he had delivered a lecture to the NSW Division of the WIA in December 1921, entitled 'European Signals Amplified by 20 Valves'. And thereby hangs another

## ANTARCTIC HEARS "TALKIE" IN SYDNEY.

### World's Broadcast of "Hollywood Revue."

By A.W.A. Short-Wave Station **2ME.**

A SUCCESSFUL feat in wireless broadcasting was accomplished on February 28, when the A.W.A. Overseas Short-wave Broadcasting Station 2ME broadcast, for world reception, the midnight performance of Metro-Goldwyn-Mayer's "talkie," "Hollywood Revue," from the new Roxy Theatre, Sydney.

Messages reporting satisfactory reception were received from the Antarctic ; while the whaling ships "Sir James Ross Clark" and "Nielsen Alonzo" reported good reception.

Reports from San Francisco, Suva, the s.s. "Makura," which is now north of Tahiti, and from all parts of Australia, state satisfactory reception.

The transmission was effected by Amalgamated Wireless, through their 20 k.w. short-wave station at Pennant Hills, which was designed and manufactured at the company's Radio-Electric Works at Sydney, and which is the most powerful station in the Southern Hemisphere.

This is the first occasion in Australia on which a "talkie" revue has been broadcast simultaneously to the whole world.



Mr. J. G. Cookson, in charge of the transmitter at Pennant Hills.

*A report of George Cookson's 2ME broadcast of the sound track from MGM's 'Hollywood Revue', from the March 1930 Issue of The Radlogram'.*

tale, just waiting to be told. But back to 2FC:

On Sunday nights, according to Len Cookson, a large number of people used to congregate around the 2FC station building to listen to the program, often staying there until the last bus left for the Milson's Point ferry — which was about the time the program finished, anyway! Such was the public appetite in 1924 for a different kind of entertainment.

### Short-wave radio

The mid 1920s saw not only the birth of domestic broadcasting in Australia, but also the realisation that short-wave technology could provide reliable international communication by radio telephony. The commercial links which had been forged by Ernest Fisk between British Marconi and AWA proved vital to the expansion of wireless technology in this whole area.

After a period at 2FC, George Cookson was also sent to England to expand his knowledge of current trends — an assignment which was subsidised, rather ironically, by rostering him as ship's operator for both legs of the voyage. Len recalls that his father had just three crazy weeks to get his operating skills back up to commercial standards.

Back in Australia, he was re-posted to Pennant Hills as Engineer-in-Charge, re-installed in the house that had previously been the family home and once again officially on call 24 hours per day.

Meanwhile, the range of equipment at the Pennant Hills complex, and the scope of its activities was expanding progressively such that, in his lecture to the IRE World Radio Convention in 1938, AWA General Manager L.A. Hooke noted that it comprised 14 transmitters, from 500W to 10kW aerial power and covering wavelengths from 13 to 2400 metres. They fed a wide selection of aeriels with CW, ICW and speech signals, as appropriate.

Among the transmitters for which George Cookson found himself responsible was AWA's locally-built 20kW 2ME — often referred to as **VK2ME** — ostensibly the most powerful short-wave transmitter in the Southern Hemisphere during the '20s and early '30s.

In September, 1927, 2ME transmitted an ambitious presentation on 28.5 metres, which the BBC rebroadcast throughout Britain to the delight of a huge audience across the UK. That and four similar programs, which followed during the remainder of the year, set a pattern for 'Radio Australia', even to the distinctive signature sound — the

laugh of the Australian kookaburra.

The broadcasts also anticipated by some years the BBC's own popular Empire Short-Wave Service.

George Cookson was involved in another newsworthy broadcast in March 1930. With a quite different audience in view, he arranged a transmission of the soundtrack from the then-new MGM film *Hollywood Review*. Screened at the equally new and ornate *Roxy* Spanish theatre in nearby Parramatta, it brought a touch of home to men manning Australia's Antarctic Base, and to the whaling ships *Sir James Ross Clark* and *Neilsen Alonso*. Excellent reception was reported from San Francisco, Suva and the *S.S. Makura* in the Pacific north of Tahiti.

In his letter, Len Cookson recalls that, about this time, just before the opening of the Sydney Harbour Bridge, guards were posted at the Pennant Hills complex, because of political unrest and apprehension about the intentions of the somewhat militaristic 'New Guard' movement.

## NZ stations

A news clipping records that, while still engineer-in-charge of the Pennant Hills Radio Centre, George Cookson was diverted to New Zealand to supervise planning and installation of new equipment for the New Zealand broadcast stations 1YA, 2YA and 3YA. Designed and built in the AWA **radioelectric** works at Ashfield, Sydney, the new and more powerful equipment replaced earlier transmitters supplied by STC London in 1927.

With an aerial power of 10kW, 1YA Auckland was destined to be the most powerful broadcaster in Australasia at the time, compared with 5kW for 2YA in Wellington and 3kW for 3YA in Christchurch. New aerials and new

studio equipment were also installed.

On returning to Australia, George Cookson was posted to the AWA Head Office in York St, Sydney, where he remained until the outbreak of World War II. He was then transferred to the La Perouse complex, which had been set up as the receiving centre, complementing the transmission facilities at Pennant Hills. Equipped at the time with some 30 receivers and aerial arrays covering the range 13-20,000 metres (Ref. L.A. Hooke, IRE World Radio Convention, 1938) it also had a subsequent wartime involvement with radar for the armed forces.

A respected member of the IREE, George Cookson's final assignment, prior to his retirement, was to supervise the installation of AWA equipment at the new Overseas Telecommunication Commission (OTC) HF transmission centre at Doonside, on the western fringe of Sydney. Officially opened around 1957, it marked the ultimate displacement of AWA by OTC from international telecommunications. With an array of modern HF transmitters and a forest of console-switchable beam antennas, the move rendered the Pennant Hills complex redundant.

A companion receiving centre was set up at Bringelly, on the southern outskirts of the city, supplementing the facilities at La Perouse.

At the time, the new equipment was about as far removed as it could be from the sparks and arcs, the coherers, the crystals and the Leyden jars that characterised the technology that greeted George Cookson when he first set foot in the transmitter hut at Pennant Hills back around 1920.

Ironically, the HF equipment at Doonside is now itself 'old hat', with communication satellites in space and optical fibre cables in the offing. But

this does not detract from the contribution that George Cookson made to that segment of evolving technology with which he was concerned. George died in 1962.

I am indebted to another AWA ex-employee for the tribute and the truism:

"We've heard a lot about the Fisks of this world who steered large organisations to commercial success. But they'd have gone nowhere if it hadn't been for blokes like George Cookson, who kept the roadwheels turning!"

Thanks, Len, for the notes on which your father's story was based. There has to be any number of other similar stories out there waiting to be told.

## More on Fleming

To change the subject rather abruptly, I have to hand a letter from Alan March of North Turrumurra, NSW, who was prompted by my article in the April 1990 issue on Sir John Ambrose Fleming to look up his name in an *ancient Harmsworth Encyclopaedia*, published in 1905. He was rewarded with a few more details of his then contemporary activities:

*FLEMING, John Ambrose (1849). English electrical engineer, born at Lancaster. When the Edison Electric Company was formed, he was appointed their electrical engineer and superintended the introduction of electric lighting into England. The erection of the present engineering and electrical laboratory at University College, London, was due to him and he is now regarded as one of the first living experts on electrical matters.*

*He has published: 'Short Lectures to Electrical Artisans' (2nd ed. 1885); 'The Alternate Current Transformer' (new ed. 1903); 'Electric Lamps and Electric Lighting' (2nd ed. 1899); 'Magnets and Electric Currents' (1898); 'Handbook for Electrical Laboratory' (1901-3); 'Waves and Ripples in Water, Air and Ether' (1902).*

Alan March says that Fleming does not get a mention in the section on electro-magnetic waves, and the only detectors discussed are 'Lodge's small revolving metal wheel dipping into mercury' and Fessenden's use of the 'heating action by leading the oscillating currents through a very fine wire or a fine thread of liquid'.

The encyclopaedia's evaluation of wireless technology at the time was that 'the speed of working...is very inferior to the speed obtained with telegraph wire or cables. On this account, the method will be useful only for temporary installations, or places where cables are difficult to lay, such as the beds of

### MR. COOKSON BACK FROM CHRISTCHURCH.

Mr. George Cookson, of A.W.A., engineer-in-charge of Sydney Radio Centre, Pennant Hills, returned to Australia in May after spending seven months in New Zealand, where he was in charge of the installation of 3YA, the new broadcasting station and studio of the New Zealand Broadcasting Board at Christchurch. The equipment for 3YA, which has a power of 3 kilowatts in the aerial, was designed and manufactured by A.W.A. Christchurch station is now the best of the New Zealand broadcasters, and gives not only a first class service in the South Island, but is heard in the North as clearly as Wellington.

Christchurch station will soon, however, be eclipsed by Auckland, for which A.W.A. is now constructing a station delivering 10 kilowatts in the aerial.

**Another clipping from the July 1934 issue of 'The Radiogram', announcing George Cookson's return from New Zealand.**

## WHEN I THINK BACK

that 'For signalling between ships, or between ships and shore, the method is unique'.

Interestingly, says Alan March, the Zeeman effect and the possibility of some physiological effects in the nervous system or the eye are mentioned. One would not expect the Zeeman effect to have been widely known at the time, but perhaps the award of the Nobel prize in 1904 for the discovery may have brought it to attention. I quote:

it would be a pity to lose sight of the early history of this fascinating and now pervasive technology. Your articles help to remind one of remarkable people and their early discoveries and I hope that you will continue to think back for many years to come'.

Thank you for your kind remarks, Alan, but whether I would ever have gotten around to the Zeeman effect is another matter. In fact, I even had to be reminded that the term had to do with the interaction of spectral rays and magnetic fields.

Ironically, the reminder — and the explanation — came not from a modern textbook but from an old one that I bought last year because it summarised scientific thinking around the time that I was born. Called *Scientific Ideas of Today*, it was compiled by Charles R. Gibson FRSE and published in 1916.

Very briefly, the Zeeman effect was the title given to Professor Zeeman's work in providing experimental verification of a mathematically-based theory about 'aether light' developed by another Dutch scientist H.A. Lorentz. Postulated in 1880, the theory was verified in 1896 — eight years ahead of the Nobel Award and nine years before the *Harmsworth Encyclopaedia* was published.

### Bourne organs'

Yet another jump in time and topic brings us to the mention of organs, electronic and otherwise, in the December 1989 issue. E.F. (Ted) Lloyd of Windways Engineering Services, in Semaphore Park, SA, writes to say that he and his wife Helen own what they believe to be the biggest organ that was completed by Alan Bourne of Newcastle, NSW.

It was specially built, he says, in 1958 for the famous 'Franquin' Magician International, forming an essential part of the show and providing musical enter-



**Believed to be the largest Bourne organ ever built, this instrument is being rebuilt by Mr Ted Lloyd of Semaphore Park in SA. It was originally built for the magician-hypnotist 'Franquin', in 1958.**

tainment in tours throughout Australia and New Zealand. Leading theatre organists played for what were commonly sell-out performances, including Penn Hughes, Ian Thomas, Alan Bourne himself (who played in WA) and Sydney organist Ian Davies (for the last three years of the show).

According to Ian Davies, the organ was then sold to the illusionist The Great Levant, but was ultimately bought privately by a Lane Cove electrical engineer in the early 1970s.

He played it until the keyboard note actions finally wore out. The keyboards were removed for re-building, but a serious road accident prevented the owner from completing the task. Instead, the somewhat historic instrument was offered for sale in the NSW Theatre Organ Magazine 'as is'.

"What a mess" said Ted, when he journeyed to Sydney in a pick-up truck to buy it. The console had been stripped, in preparation for a re-polish; the new keyboards were unmounted and without contacts; the loudspeaker enclosures were in panel form and incomplete.

A visit to Alan Bourne's workshop suggested that the instrument was number 11 of the 23 built, for which they were able to obtain a few pictures and diagrams. For the rest, Ted was largely on his own.

Back home in SA, serious re-building commenced in February 1988, occupying most weekends and many evenings after work. Two years later, the instrument was nearing completion with new veneers, edge strips and trims to simulate the original finish.

The new keyboards were mounted on pivoted, folded steel channels for im-

proved accessibility, and fitted with Kimber-Allen gold plated contacts, wiring looms and small PC boards to simplify re-connection to the original output banks. The pedal clavier was rebuilt with extra contacts for additional voices.

A complete theatre-style bench was added, plus a new music rack and a theatre-style reading light. The loudspeaker enclosures had also been rebuilt, each containing a new 1(10W amplifier plus four 30cm woofers facing forwards and two 2(km mid-range at the top, reflected forward by the lift-up lids.

The organ has now reached the playing stage, thanks in no small measure to the help and guidance of two friends identified only as Peter and John. It now boasts an electronic piano and harp on solo and pedal manuals and a 24V-operated 'toy counter' controlled by Wurlitzer-type toe studs in the front rail.

Ted's plan is to see the restored 'Bourne de Luxe' organ installed and featured as a full-scale entertainment instrument, in a suitable restaurant or winery convention area. "along with its history".

With that in view he adds: "Would any readers who have any information, copies of Franquin programs, or details of those or other existing Bourne organs please write to me". His address is:

Edward F. (Ted) Lloyd,  
27 Fairford Terrace,  
Semaphore Park, SA 5019.

He suggests that anyone who has or knows of similar early instruments should consider obtaining and restoring them to playing condition.

"They will find it a very rewarding pleasure".

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