



# When I Think Back...

by Neville Williams

## Raymond Allsop - WW1 wireless operator, engineer, FM pioneer

Raymond (Ray) Allsop is well remembered for his contribution to the Australian sound-on-film industry and for his largely unrequited love affair with FM broadcasting. Less well known is the fact that he was a licensed radio amateur at 13, a wartime shipboard operator in his teens and the inaugural chief engineer of Australia's first official wireless broadcasting station.

Raymond Cottam Allsop was born on March 11, 1898. Bitten by the proverbial wireless 'bug' at age 10, he was one of the true industry pioneers in Australia; yet he lived long enough to glimpse the emergence of modern-day electronics in its many forms.

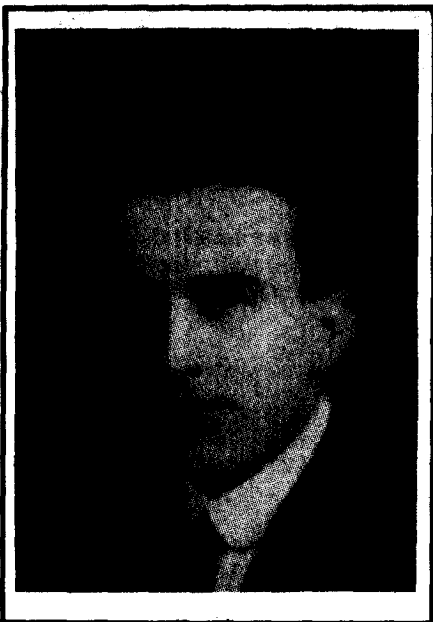
An enthusiast and a visionary, at least some of his efforts in the intervening years, through to 1972, are probably better appreciated in retrospect than they were when he was diligently promoting his views to the regulatory authorities and to industry associates. But more about that later.

Formally educated at Sydney Grammar School, Ray Allsop received his wireless 'baptism', while still a schoolboy, at the hands of Father Shaw – a controversial priest/enthusiast who set up an experimental wireless station (callsign XPO) at a Roman Catholic seminary in Randwick, Sydney, not far from the Allsop family home.

Officially responsible for the financial affairs of the seminary, Father Shaw combined business with pleasure and duty(?) by gradually increasing the scope of his wireless activities until they culminated in the Shaw Wireless Company, complete with factory, orders, staff and overheads – to the sometime discomfort of church authorities.

But that is a story in itself, which was recalled in the 'Bright Sparks' historical series broadcast on ABC Radio in 1988 during the bicentenary celebrations.

It is sufficient to say that, on leaving school in 1913, Ray Allsop was apprenticed to Father Shaw's Company which was, at the time, building Australian



**Ray Allsop at age 25, pictured on his appointment as Radio Engineer to New Systems Telephones, a company which later came to be known as Emmco and still later STC. (From Australasian Wireless Review, May 1923).**

Coastal Wireless stations for the Commonwealth Government.

### An amateur at 13

In the meantime, he had picked up enough about the mysteries of wireless, presumably from Father Shaw's activities, to gain an experimental licence from the PMG in 1911. This enabled him to set up his own spark type wireless telegraphy station at the family

home in Barker St, Randwick.

As described in the *Australasian Wireless Review* for June 1923, Ray's pre-war amateur installation comprised (and I retain the original terminology):

**RECEIVER:** A loose coupler and loading coil, aerial tuning condenser, perikon and other crystal detectors. Iron pyrites and silicon were used but his best work was done with galena. He used to tune in Macquarie Islands, all the coast stations and the incoming shipping.

**TRANSMITTER:** A 2 kilowatt alternator, driven by a 5 horsepower motor using City Council current supply. The transformer stepped up the current to 20,000 volts. The transmitting condensers were of the Leyden jar type and the inductance was the usual helix. The spark gap embodied a patent invented by the Shaw Wireless Company. It involved a stream of compressed air, conducted through one of the electrodes, which was hollowed out for the purpose. The air, blown through the spark, drove off the ionised gases and made for a more even spark discharge. The air was compressed by a Kellogg 4-cylinder pump.

With the transmitting set, ARW says that "Mr Allsop has been picked up in the Great Australian Bight, a wonderful amateur achievement in those days".

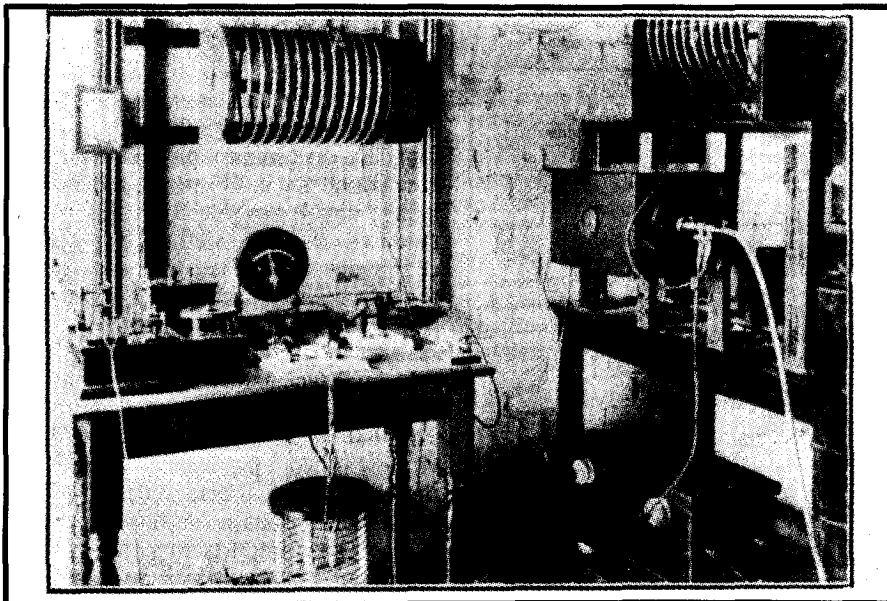
It also notes that he had a Lodge-Muirhead coherer in 1910, with a Morse Tape machine as part of his receiving equipment. On the shelf under the main transmitter was a standby spark discharge transmitter using a 2" spark coil.

Reading this account, I could not but contrast the resources that Ray Allsop had as a teenager to the few humble oddments that most young enthusiasts had to make do with in the post World War 1 generation.

### Wartime operator

While still a teenager, he obtained his Australian and New Zealand commercial certificates and served as ship's wireless officer on a number of vessels engaged in the Australasian trade: among them the *Levuka*, *Riverina*, *Wyandra* and *Cooma*.

In 1916, he joined the RAN troopship *Argyleshire* as senior operator. It was



**Ray Allsop's pre-World War I spark type wireless telegraphy transmitting and receiving equipment, as pictured in *The Australasian Wireless Review* for June 1933.**

subsequently torpedoed in the English Channel, barely making it back to Davenport. Ray Allsop was duly returned to the laboratory of the Wireless Works at Randwick which had, by then, been acquired by the Naval Authorities.

In 1918, he was appointed senior wireless officer on the troopship *Indarra* and served in that capacity until a couple of months after the Armistice was signed. He returned once again to the laboratory at the Randwick Naval Wireless Station and remained there until it was taken over by the Repatriation Department.

By that time, its activities had broadened to include the production of military packets and special wireless apparatus for the Navy.

As soon as it became legally possible, Ray Allsop had resumed his amateur station activities (callsign 2YG), turning his attention to radio telephony. He claimed, in fact, to have been the first Australian experimenter to communicate in that mode, on shortwave, direct with the UK and USA. This was in 1924.

His interest in telephony was actually just one facet of a growing interest in audio technology, extending to sound recording and the then-intriguing subject of cinema sound – 'talkies'.

With the shift in his technical interest and the transfer of the Randwick works to Repatriation, Ray Allsop decided, in early 1923, to join New Systems Telephones Pty Ltd, whose parent company was one of the largest telephone and wireless equipment manufacturers in the British Isles. Their sights were clearly on the wireless/radio boom that seemed

certain with the anticipated recognition of radio broadcasting in Australia in that same year.

### Founding engineer, 2BL

As an engineer with New Systems Telephones (later STC) Ray Allsop was directly involved in the establishment of Australia's first official broadcasting station, 2BL Sydney, which is listed in the *Macquarie Book of Events* as having commenced service on November 23rd, 1923. There is more to it, however.

Sponsored at the time by Broadcasters Ltd, managed by W.J. Maclardy, the venture had the backing of the now defunct *Guardian* newspaper. The same Mr Maclardy was the Managing Editor of Wireless Newspapers Ltd and who, in August 1922, had launched the first issue of *Wireless Weekly*, the distant ancestor of today's *Electronics Australia*.

Racing against the calendar, and other hopeful broadcasters, the original 10-watt (some say 15W) transmitter was constructed by Ray Allsop and duly installed on the roof of the *Guardian* building in Philip St, Sydney by Messrs Allsop, Maclardy, "with the assistance of Mr E. Joseph, the well known wireless expert, and several others"; this was on a miserably wet Friday afternoon in late October 1923.

With the permission of Mr J.J. Malone, Chief Manager of Telegraphs and Wireless, it went to air with the experimental callsign 2HP on 350 metres (875kHz) – described at the time as 'short waves' and preferred,

because reception was less prone to atmospheric interference than on long waves (1000+ metres).

Despite the very limited power, listener response was immediate – embarrassingly so for the *Guardian* newspaper, which had allowed the station to 'borrow' its telephone numbers B7111 to B7117. According to *Wireless Weekly* (October 26, 1923) "all seven lines were jammed" during that historic Friday afternoon and evening – and for much of Saturday, with local and trunk calls. (A modern newspaper is more likely to have several hundred lines).

In both *Wireless Weekly* and *Australasian Wireless Review*, the signals from 2HP were reported as being heard widely throughout NSW.

On November 1, 1923, the *Guardian* announced that scheduled services would begin within about two weeks. Their objective was 12 hours per day of free broadcasting – an intention that apparently got tangled up for a while with the ill-fated Fisk sealed-set scheme, mentioned earlier in these articles (July 1989).

The official service began on November 23 with the callsign 2SB, but this was subsequently changed to 2BL (for Broadcasters Ltd) to minimise possible confusion, as heard, with 2FC. In February, 1924, ARW was lavish in its praise of the sound quality of the new station, with credit being given to engineer Raymond Allsop for the many improvements which he had been able to effect in the short time that it had been on air.

At this very early stage Palings Ltd also became involved and organised a series of concerts from their concert hall, presented by musician/songwriter Oswald Anderson with Ray Allsop handling the technical arrangements. Commencing in February 1924, they were claimed to be the first officially broadcast concert series in Australia, with Oswald Anderson as Australia's first professional radio announcer.

### Historic broadcasts

But in those days, at least, Allsop the engineer was still very much the amateur operator/enthusiast as well. In 1925, he intercepted a shortwave (HF) test transmission from KDKA in Pittsburgh, USA, the world's first broadcast station, and relayed the program over 2BL.

In 1927, he organised a similar re-broadcast of PCJJ Hilversum, Holland and such was the public response that he decided to go one better.

At the time, the BBC had not set up

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its overseas service and Ray Allsop arranged, through the Netherlands Consul in Australia, for Hilversum to pick up 2LO London and relay the signal on 30m (10MHz). It was picked up at the Allsop home in Roseville, Sydney, and fed by landline to Coogee for rebroadcast over 2BL – the first time voices from London and the sound of Big Ben had been heard by Australian broadcast listeners.

1928 saw yet another epic broadcast, when Kingsford Smith flew across the Pacific from Oakland to Brisbane. Sydney Newman transmitted continuous Morse homing signals from the AWA radio centre at Pennant Hills, Sydney while Ray Allsop and Tom McNeil shared a long listening vigil, interpreting the code messages from the Southern Cross and keeping 2BL listeners up to date with the plane's progress.

For good measure, it would appear that, about this time, Ray Allsop and another pioneer amateur, Don Knock, were acting as writers and consultants to *Wireless Weekly*. An article in the July 5, 1929 issue classifies Ray Allsop as the Associate Technical Editor – an arrangement that apparently lapsed when Ross Hull took over in mid 1929.

By then it probably didn't matter, anyway. As the late Philip Geeves points out in 'Australia's Radio Pioneers', published in *EA* for April 1989, Ray Allsop had developed an absorbing interest in sound motion pictures.

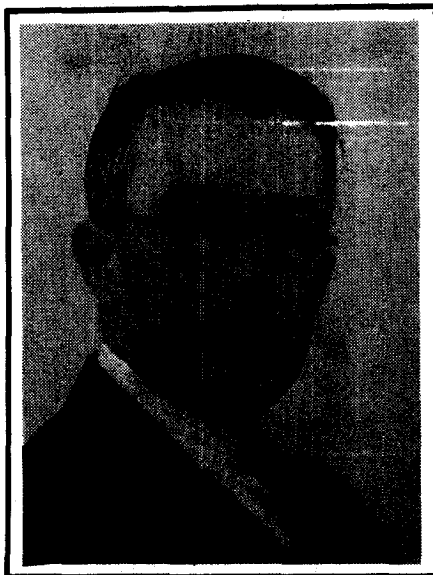
Back in 1921 he had worked out a scheme for synchronising a wax cylinder with motion picture film, but was realistic enough to admit that sound technology had a way to go before it could be mated successfully with film presentation.

The abovementioned issue of *Wireless Weekly* carried an article titled 'Developing the Raycophone', in which he describes his earlier efforts as: "necessarily dilettante dabblings".

### Talkie equipment

This time around, he developed a highly practical range of 'Raycophone' supplementary sound equipment, with which existing silent projectors could be converted for the new sound-on-film 'talkies'. Geeves records that, despite intense opposition from the major American suppliers, he provided the sound in almost half of Australia's cinemas at a fraction of the cost of imported equipment.

The highlight of Allsop's affair with cinema sound came on Sunday evening,



**As pictured in the 1938 World Radio Convention Record. An IRE council member at the time, Ray Allsop demonstrated to delegates stereo sound reproduction and stereo film sound at Sydney's Plaza theatre.**

April 10, 1938 when he arranged and presented a technically historic film show to delegates attending the World Radio Convention in Sydney.

As a councillor of the IRE and Director/Chief Engineer of Harrington's-Raycophone, he had sought and obtained the cooperation of Hoyts for use of the Regent and Plaza theatres for the occasion. Located on opposite sides of George Street, just up from the Sydney Town Hall, they were conveniently located and readily able to be linked by twin, specially balanced audio lines.

Two high quality microphones were set up in the stalls of the Regent, about 20' (6 metres) apart, facing the Regent Theatre orchestra. At the other end of the line, amplifiers and large theatre style multi- and bi-cellular horn loudspeakers recreated the sound on the stage of the Plaza theatre.

To most of the audience, it was the first time that they had heard what we now know as stereophonic sound – certainly on anything like the scale demonstrated on that evening.

This was followed by a demonstration of stereophonic sound on film, featuring pianist/entertainer Jack Lumsdaine, soloist Shiela Ridette and two unnamed table tennis players.

Only once before had film stereo sound been demonstrated anywhere in the world – in New York during the previous October – before the Society of Motion Picture Engineers (SMPE), of which Ray Allsop had become a Fellow.

### 'First class engineer'

At the presentation, it was explained that recording and playback had been achieved using what looked, on the film, like an ordinary push-pull variable area sound track. However, rather than being mirror images, Ray Allsop had modified the recording and playback equipment so that the two sides represented the left and right signals, and were duly sensed and reproduced as such.

In introducing Ray Allsop on the occasion, IRE President Sir Ernest Fisk said that in the motion picture field, by virtue of the work he had performed and the results he had achieved, Mr Allsop could be regarded as nothing short of a genius. The products manufactured by the organisation of which he was director and chief engineer stamped him also as a first class engineer.

At the time, Harrington's-Raycophone was represented in all Australian capitals and in New Zealand, and had installed their equipment in 375 theatres. However, as the era of add-on sound equipment passed, they found it increasingly difficult to compete with the resources of their much larger overseas competitors and the brand-name ultimately disappeared.

After serving on the council of the IRE, Ray Allsop was elected IRE President for 1947-8, in very distinctive company and succeeding such notable pioneering figures as Sir Ernest Fisk, N.S. Gilmour, J.J. Malone, A.S. McDonald and D.G. Wyles. He was succeeded in turn by Murray Stevenson, long-time engineer of radio 2UE in Sydney and later chief engineer of ATN TV, key station of the 7-network.

### FM broadcasting

In the wake of his preoccupation with motion picture sound, Ray Allsop was seemingly bitten by yet another wireless 'bug', this time in the form of FM (frequency modulation) broadcasting.

It had long been appreciated that a radio carrier could be modulated in a number of ways, but the development of technology was such as to favour the use of amplitude modulation (AM) for both radio telephony and public broadcasting.

By nature, however, AM was prone to interference by atmospheric and man-made (electrical) noise – a fact that Major Edwin H. Armstrong of Columbia University highlighted in May 1936, with a landmark paper in the *Proceedings of the IRE (USA)* entitled 'A

method of reducing disturbances in radio signalling by a system of frequency modulation'.

As reported in *Radio & Hobbies* for July 1939, the paper was backed up by a lecture to the Radio Club of America, at Columbia's Pupin Hall and by companion papers delivered by messrs Weir, Flyer and Worcester from GE (General Electric Co) at Schenectady.

Experimental transmissions were made from W2XAM at Alpine, NJ (42.8MHz, 20kW) and 2AG in Yonkers, NY (110MHz, 1kW). The tonal purity, carrying power and freedom from noise was described as amazing, especially when the power from 2AG was reduced to only 1 watt, by bypassing the output stage of the transmitter.

Said Major Armstrong: frequency modulation transmission has moved ahead of program source equipment.

## Support from GE

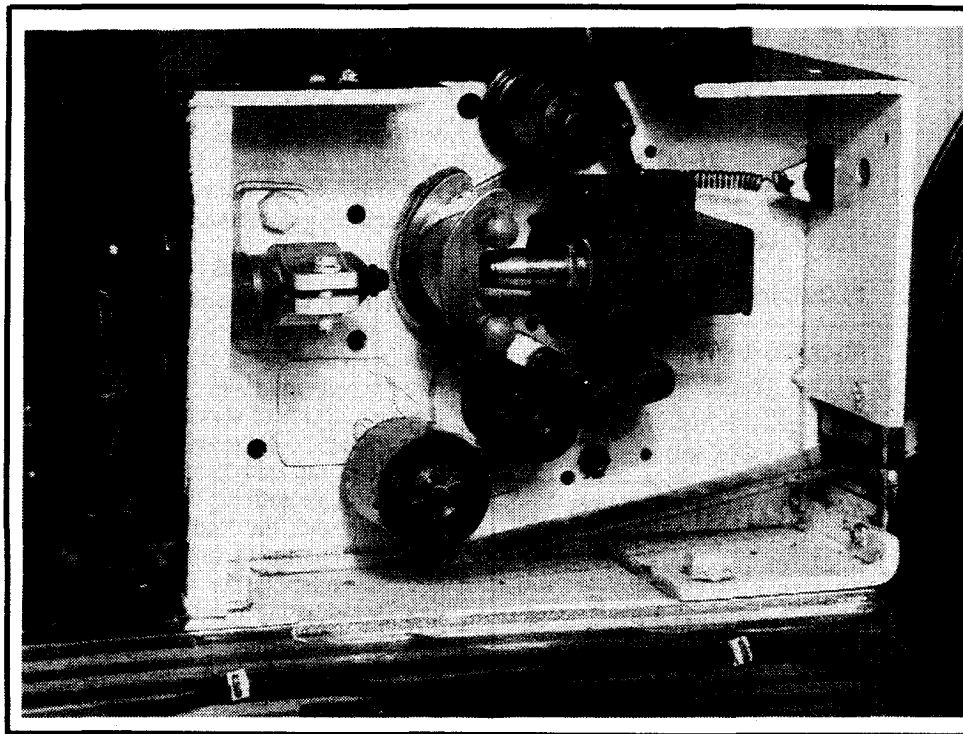
In *R&H* for October 1939, Dr W.R.G. Baker, Head of GE's radio and TV division, is quoted as saying that, within a year, high fidelity static-free transmission would be filling America's airwaves; this was to a delegation of college and university professors. FM transmitters could be built, he said, for about one quarter the price of a typical AM transmitter and, because of the nature of VHF transmissions, there would be room for more networks and an almost unlimited number of stations.

In tests before representatives of the Federal Communications Commission and the Interdepartmental Radio Advisory Committee, GE officials were reportedly able to demonstrate a 96% reduction in atmospheric and man-made noise, compared with typical AM reception.

The November 1939 issue of *R&H* emphasised the on-going interest in FM broadcasting in the USA, with the release of receivers able to intercept experimental transmissions. An article on the theory of FM was reprinted, by arrangement with *Shortwave Craft*.

But World War II had intervened and, in the March 1940 issue, *R&H* Editor John Moyle conceded that, in Australia, FM broadcasting would have to be set aside until the cessation of hostilities.

As a former ship's radio officer and founding engineer of Australia's first broadcasting station, Ray Allsop had good reason to welcome FM broadcasting, with its relative freedom from noise interference. But he, too, had a part to play in the new war, being commis-



**A modified but still identifiable example of Ray Allsop's original 'Raycophone' sound head for 35mm theatre projectors, which enabled many Australian cinema owners to convert to sound at an affordable price.**

July, 1929.
WIRELESS WEEKLY
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# Developing the RAYCOPHONE

By **RAY ALLSOP**  
*(Associate Technical Editor, Wireless Weekly.)*

*How a young Australian wireless engineer produced the first all-Australian talkie installation. This outfit is now being operated in a number of city and suburban theatres and compares more than favorably with British and American machines.*

which are amplified and reproduced through loud speakers.

With the disc method of operating talking films the disc machinery is geared to the electric motor which runs the cinematograph; and, as a result of this carefully calculated gearing the synchronisation is again perfect, and the sound is taken out through the same amplifying channels as are used for the amplification of the sound-track film.

So it will be seen that synchronisation is obtainable with quite simple devices. And once you have attained to perfect synchronisation there is nothing more to that branch of the machinery. The whole trouble with talkies is not synchronisation; but amplification. You have to fill enormous theatres with the sounds taken from a revolving disc, or a strip of film. This involves deep problems of reproduction and acoustics, an which it would be impossible for me to touch in the limited space available. It is enough to say, that by careful experimenting, we have evolved amplifiers and loud-speakers which compare more than favourably with overseas productions, and are now manufacturing complete outfits for sale.

The vital part of the Raycophone is indicated by the arrow. Enclosed here is the sensitive photo-electric cell.

EIGHT years ago I became interested in the synchronisation of sound effects with photographic moving film; and proceeded with a series of experiments towards designing an efficient machine, capable of reproducing behind the screen the sounds associated with the actions of the audience people. I was working on the principle now known commonly as the "Telephone," which reproduces sound effects and speech by the wax disc medium, was succeeding with these experiments; but eventually abandoned them. They were necessarily dilittante dabbings at the time.

At any rate, broadcasting was a better proposition eight years ago than Synchronised Films. But when I found that Synchronisation had succeeded over the other side so well that it constituted a menace to the silent film, and that talking films on both disc and sound track bases were being manufactured in commercial quantities, and that these innovations were coming out to Australia, I decided to attempt bringing my old plans to fruition, and worked on them during my spare time.

The synchronisation of sound with films was a comparatively easy matter. With

**In July 1929, Wireless Weekly carried this article on his talkie work, written by Ray Allsop himself — described as the magazine's Associate Technical Editor.**

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sioned Lt Commander, RAN.

In this position, and working closely with the RAAF and Army, he was involved in the design and production of Asdic and Radar units for the detection, respectively, of submarines and aircraft.

### FM in Australia

After the war, however, he wasted no time in putting his weight behind the new technique – a personal campaign that began in 1946. It was pursued through a term of service on the ABCB (Australian Broadcasting Control Board) in the mid 1950s and continued right through until his death in 1972.

In principle, the Radio Branch of the PMG's Department supported his views and, in collaboration with the Australian Broadcasting Commission, went so far as to licence 'experimental' FM transmitters in Sydney, Melbourne and Adelaide in 1948, and another in Brisbane in 1952. Fed with one or other of the ABC programs, they were not publicised to any extent and not regarded as an obligatory ABC service. Even so, they built up a keen following among the hifi fraternity.

Ray Allsop was delighted, of course. At least it was a start.

But the transmissions also consolidated opposition from the entrenched commercial AM broadcasters, who had no desire to share the advertising revenue 'cake' with newcomers – certainly not the 'almost unlimited number' of stations that had earlier been predicted in the USA. It was conceded that the experimental stations might ultimately provide the basis for an ABC service but, in 1948, the newly appointed ABCB put their collective minds at rest by decreeing, from the outset, that no commercial FM stations would be licensed in the foreseeable future.

What's more, the decision did not appear to upset the major Australian equipment manufacturers. The pent-up demand of the war years remained to be filled with new AM receivers, and up ahead was the prospect of television. Why complicate the situation with FM – for the sake of a vocal minority of hifi nuts, who usually preferred overseas equipment anyway?

Looking back on that period, I have the lasting impression that Ray Allsop's dedicated pro-FM campaign made him a prime target for the many 'we-don't-need-FM' industry executives. They enjoyed putting him down. His real objective, they said, was a station, a network of his own. And they guffawed when he

was later offered an experimental licence, on condition that he did not broadcast music!

The VHF FM band (88-108MHz) survived the introduction of television in 1957, but when the allocations were reorganised in the early 1960s to secure more TV channels, the FM band was decimated and the ABC experimental transmissions were terminated.

In announcing their decision, the ABCB suggested that, if and when Australia needed FM broadcasting, space for it would be found in the UHF sector.

The TV broadcasters were encouraged by their own success, receiver manufacturers were delighted with the wider market and AM broadcasters were assured by the indefinite postponement of FM. Just about everyone else was content – except Ray Allsop and an emerging body of music lovers.

And Ray certainly didn't miss any opportunity to make his point. In a long letter to the Editor of the *Australian Financial Review* (October 6, 1967) the man who had learned his craft with a spark transmitter, a Morse key and a galena detector praised the initiative of AWA Microelectronics for having produced Australia's first batch of integrated circuits.

While this had important implications for the defence industry, he said, it also held promise for the ultimate production in Australia of UHF receivers using the FM principle "(for many years recommended by the Post Office as the most satisfactory means of expanding the broadcasting system)".

In the *National Times* for January 13, 1971 he was reported still to be actively campaigning for the introduction of FM broadcasting – this when they announced that he had been awarded the OBE in the Queen's New Year Honours List, for pioneering work and services to radio.

Ironically, he died at age 75 on March 19, 1972 – about the time that the Whitlam Federal Government were re-examining the whole structure of the radio industry, and of radio and television broadcasting.

Had he but lived another couple of years, he would have heard the decision to clear the 88-108MHz band and to establish FM-stereo broadcasting in Australia.

In one sense, that is another story. But 25 years of dedicated campaigning by one of Australia's radio pioneers had to have something to with it. 