When I Think Back...

by Neville Williams

FM broadcasting in Australia – Chronic loser, ultimate winner!

FM broadcasting has had a chequered history in Australia. Hailed as a breakthrough into high-quality, noise-free radio, it was delayed by World War II, pushed aside by television and then scuttled by short-sighted planning. But it staged an amazing comeback and is now rapidly overhauling the established AM system.

In practical terms, the story of FM broadcasting, worldwide, dates from a paper by Major Edwin H. Armstrong published in May 1936 in the *Proceedings of the IRE* (USA) entitled: 'A method of reducing disturbances in radio signalling by a system of frequency modulation'. Referred to in my previous biography of Raymond Allsop, I mention to it again here for the sake of continuity.

Armstrong's claims were supported by a practical demonstration to the Radio Club of America in the Pupin Hall of the Columbia University, and by papers delivered by Messrs Weir, Flyer and Worcester of GE (the General Electric Co, Schenectady).

Impressed by the potential of the new system and, with the grudging consent of the FCC (US Federal Communications Commission), GE set up a number of experimental FM transmitters, operating mainly in the 40-60MHz range. Some were later granted commercial licences and receivers made available to the public.

Radio Craft (USA) published a progress report on the new technology in its April 1939 issue, in an article entitled 'At long last – STATIC-FREE RADIO'. It mentioned two experimental stations already in operation (Albany, N.Y. and Storrs, Conn.), with six others in construction in the eastern states. This was in addition to Armstrong's own W2XMN (atop the Pallisades, N.J.) and an application for an FM licence by New York's 'high fidelity' station WQXR.

These developments were watched with considerable interest in Britain, Europe and Japan where, as in the USA, the number of stations on the AM broadcast band had reached saturation level. Here was a system that exploited a less crowded part of the spectrum and which offered high quality reproduction, plus comparative freedom from mutual interference and from both man-made and atmospheric noise.

Australian reaction

Interest was also apparent in Australia, with *Radio & Hobbies* directing attention to the new technology several times in 1939/40, the magazine's first year of publication. An editorial by John Moyle in March 1940 emphasised its importance but pointed out that, for countries like Australia, possible development of FM broadcasting had been effectively blocked by the outbreak of war.

FM broadcasting gradually came into its own in the postwar years, particularly in America, Europe and Japan.

In Britain, the BBC set up a full-scale research transmitter on Wrotham Hill, 30km southeast of London. Sited 220m above sea level, its function was to provide experience with VHF broadcasting in the 90-100MHz region, using either amplitude or frequency modulation. The experiments were destined to have long-term repercussions in Australia.

Britain formally adopted FM broadcasting in the mid 1950s, based on their Band II, 87.5-100MHz. Gradually, however, 88-108MHz gained international recognition as the logical FM broadcast band, to be cleared for that purpose as and when individual nations could reshuffle their domestic allocations.

In Australia, events followed a very different pattern, due largely to our dual system of A- (national) and B-class (commercial) broadcasting stations.

While established commercial broad-

Announcer Julie Moore in the St Leonards, Sydney studios of 2MBS-FM, in May 1988 – much better facilities than when the station began! (Courtesy 2MBS-FM)

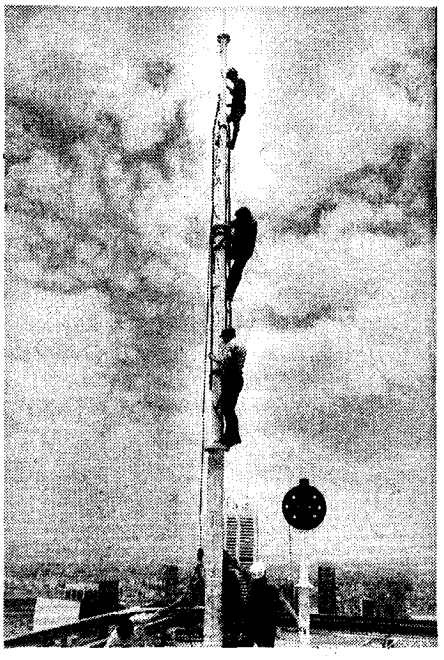
casters competed vigorously for advertising revenue, they found common cause in discouraging a technology which would accommodate further competitors. Such was their combined political clout that, when the ABCB (Australian Broadcasting Control Board) was set up in 1948, one of its early policy decisions was to rule against commercial FM stations. (*R,TV & H* Nov. 1961, p.19)

FM only for ABC

The Board's one concession to technical progress was to accept that FM broadcasting might be developed in stages by the ABC (Australian Broadcasting Commission) for its government-funded 'national' services. It was better than nothing – but only just!

The PMG's Department was not impressed by the compromise. It had inherited the job of providing technical services for the ABC, back-up services for the industry as a whole and, through their Radio Branch, the task of dealing with listener complaints about mutual and noise interference with radio reception. They understood better than most that FM technology could solve many of the problems and ensure better audio quality into the bargain.

The best they could do was to co-operate with the ABC in setting up 'experimental' FM transmitters in Sydney and Melbourne in 1947, Adelaide in 1948, and another in Brisbane in 1952. These served to provide practical experience and a measure of public interest. But they also posed a problem for the ABC, in that a viable service could not be built up on one station per city and a sprinkling of tuners operated mainly by hifi enthusiasts.



Assembling the 2MBS-FM transmitting antenna on the top of the AMP building in Sydney, in 1977.

Mr B.E. Cabena, who played a leading role in the establishment of 3MBS-FM. (Courtesy B.E. Cabena)

So the FM outlets operated for the next 10-odd years on an 'experimental' basis, with little publicity or formal programming, taking a 'split' from one or other of the ABC's AM program lines, often at the discretion of the duty engineer.

Well known electronics engineer Neville Thiele, now retired, recalls that this was the situation when he was a trainee with the PMG Dept. The FM transmitter, he said, was often fed with what the 'techs' described as the 'anti-regional' program. In the absence of a self-evident choice, it became common practice simply to feed the FM transmitter with the signals that weren't being fed to the regionals!

Again, in his Stirling Memorial Lecture (Broadcast by 5UV Adelaide, March 2, 1981) Professor Ken Inglis (University of Adelaide) recalled that "in PMG folklore, the FM transmitter in Sydney was known as the iron lung, because it kept two men alive for ten years!"

Public unaware

The Australian public remained largely unaware of the FM transmissions, and local receiver manufacturers made no attempt to change that. Admittedly, there was no cheap and easy way of extending a valve-type AM receiver to cover FM and, in any case, simple FM receivers of the period needed to be critically tuned to receive a distortion-free signal.

"Neither scope nor justification" – apply elsewhere!

September 14,1970

Dear Senator McClelland,

I refer to your representations on behalf of Mr B. Cabena, Chairman of the Music Broadcasting Society of Victoria, which is desirous of obtaining a licence to operate a broadcasting station in Melbourne to provide music for members of the Society.

I have discussed this matter with the Chairman of the ABCB. As they pointed out when they recently replied to the Society on this matter, the Broadcasting & Television Act 1942-69 makes provision only for national and commercial broadcasting stations.

Your letter on behalf of the Society raises questions of either amendment to the above Act to permit the grant of a licence such as the Society seeks, or alternatively grant of a licence under the Wireless Telegraphy Act, seeing that the frequency which the Society desires to use is outside the broadcast bands.

In either case the proposal raises questions in regard to the broadcasting services, namely whether specialised services such as the Society has in mind should be authorised. It is the view that there is neither sufficient scope nor justification for such services.

In regard to the first factor, Melbourne is well provided with broadcasting service with two national and six commercial stations. The wide activity of the national stations in the musical field is relevant. As to the second aspect, operating frequencies are a valuable resource and, having regard to demands for broadcasting service throughout the Commonwealth, their use for a sectional audience could not be justified.

Similar considerations apply in respect of the Wireless Telegraphy Act.

The Inquiry in regard to frequency modulation broadcasting will examine questions in regard to the development of the broadcasting services and, as the Board has suggested, this would present an opportunity for the Society to put forward its views.

Alan S. Hulme
(Postmaster-General)

When I Think Back

Nevertheless, quite a few hifi devotees built or bought imported tuners to take advantage of the experimental transmissions, in the hope that they would one day be formalised. A typical contemporary circuit for home constructors is reproduced herewith, from the UK magazine *The Home Constructor*.

Television was launched in Australia in 1956, and while it was allocated to channels above and below the segment 88-108MHz, the FM band remained intact except for a 4MHz overlap from television channel 3. Few seemed to be concerned about this incursion, the impact of television being such that the experimental FM stations receded even further from public awareness.

In 1960, however, a technical conference was convened by the ABCB to consider the options for expanding the TV services. As it happened, the problem was also being examined by a Radio Frequency Allocations Review Committee, appointed by the Postmaster-General and headed up by Professor L.G.H. Huxley. As one of its findings, the Huxley Committee recommended that additional TV channels should be accommodated in the still largely vacant FM band, and that FM broadcasting should be allocated to UHF, if and when the need arose.

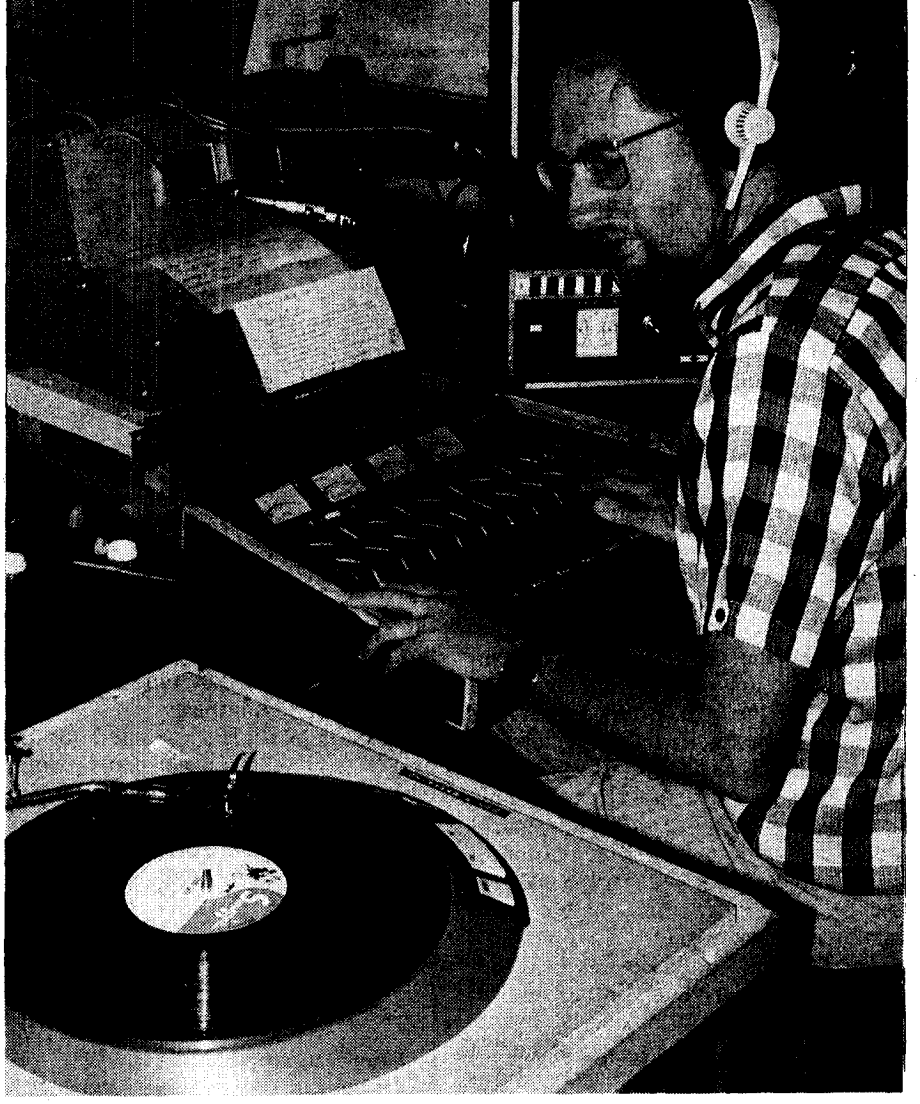
The recommendation was adopted and formalised in a statement by the Postmaster-General in May 1961. The ABC's VHF FM transmissions were discontinued in the following month, with no provision to transfer them to UHF.

AM broadcasters were pleased, as also were the TV purveyors, receiver manufacturers, and the viewers who stood to gain an extra channel. The dissenters were mainly those whom I described in an editorial (*Radio,TV & Hobbies*, April '62) as "a very large group of listeners who were dismayed by the termination of FM broadcasting". A prophetic statement in that same editorial read:

"Any time from now on, the sound broadcasting industry is going to wake up to the fact that the most potent answer to television is high quality, noise-free, compatible stereo; that it should have been radiated, not on the still problematical UHF band, but on the very VHF band that they were glad to see cut up."

In the wilderness

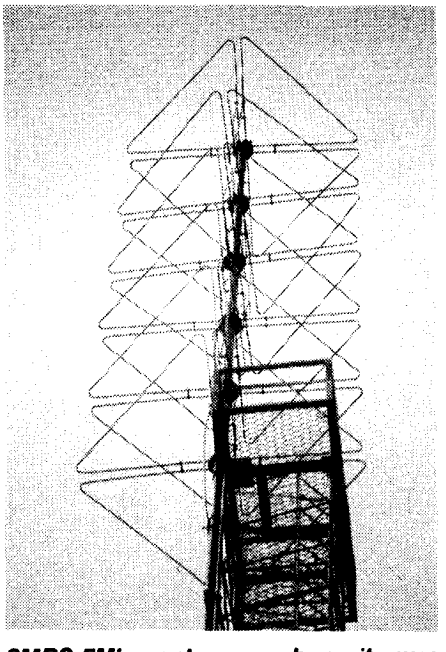
For ten-odd years, that read like a piece of pie-in-the-sky journalese, although there were still a few optimists who dared to hope for a better deal. But more of that later.



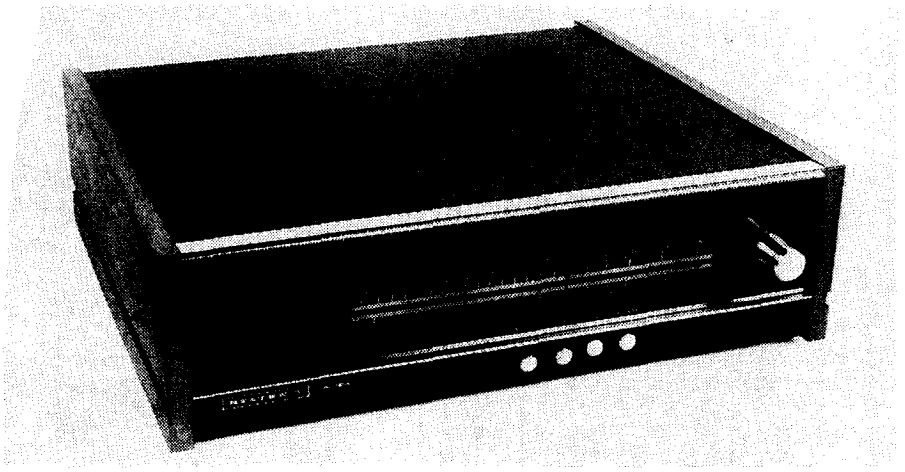
Inside 2MBS-FM's first studio in Chandos Street, St Leonards, in 1976. To play a tape, one of the turntables had to be unplugged! (Courtesy 2MBS-FM)

From the outset, the decision to abandon VHF FM broadcasting proved to be an uncomfortable one because:

- It had political overtones, in that a conservative government had effectively reversed a policy endorsed by the Chifley labor government in 1948. Disgruntled hifi/music lovers, as a result, found common cause with the opposition!
- It could well prove to be flawed, with the extra channels so gained providing, in practice, only a short-term solution to TV bandspace problems.
- Sound broadcasters had traded an internationally recognised band and proven technology for a temporary extension of the status quo in an overcrowded AM band.
- Talk of a UHF FM band peculiar to Australia was at odds with efforts being made to rationalise use of the



3MBS-FM's antenna when it was located at Kew, atop a 30m tower. (Photo by C.W. Gliddon)



An early solid state AM-FM tuner marketed as a kit by Heathkit. Manually tuned, it lacked both crystal lock and AFC (automatic frequency control).

spectrum worldwide. World standard AM/FM tuners and receivers would be unsuitable for Australia

The insecurity generated by such reservations created a high level of paranoia in relation to anything that even vaguely threatened conventional broadcasting.

Ray Allsop's enthusiasm for FM was ridiculed by his peers, on the grounds that his real motive was to get himself a private radio station in the guise of 'experimental'.

When Manager Maurice Brown had Mullard Australia's lab team design a prototype UHF FM tuner, to evaluate its overall performance, it was rumoured that he was 'up to something'. Two large companies even co-operated in monitoring the UHF sector for a clandestine FM transmitter!

When licences were sought, even for educational AM transmitters, a precondition was that the stations must not broadcast music – not even as a marker between program segments. Gongs yes, but musical passages no. They might be mistaken for entertainment! And so on – *ad absurdum*!

The comeback trail

As I remarked earlier, even in this restricted environment, there were still a few optimists who dared to hope for more imaginative use of the airwaves and, in a roundabout way, they helped turn the tide in favour of FM.

Mr B.E. Cabena of Mount Eliza, Victoria, was one of them. In recent correspondence, signed as 'The Pioneer of Public Broadcasting', he reminds me of a letter to 'Forum' we published in the April 1967 issue of this magazine. It was headed 'Radio Station for Music Lovers'.

Says Mr Cabena: "I shall be forever grateful to Mr Williams, as it was the turning point that led to the establishment of Community Radio".

Back in 1962, according to Mr Cabena, he had come up with what he believed to be a workable plan for a listener-owned broadcasting station; one presenting continuous and balanced programs of classical/serious music and financed by a subscription to program notes. Keen to promote the idea, he called a public meeting in Melbourne – but only two people turned up!

For the next five years he tried in vain to interest others and finally, in sheer desperation, addressed the abovementioned letter to 'Forum'. It produced four replies, including a long and enthusiastic letter from T.J. (Trevor) Jarvie, then a research student at Monash University. One other respondent was prepared to assist and, after a meeting of the trio, it was left to Mr Cabena to round up three more people to form a committee of six.

It took until July 1968 to assemble the requisite number and, formalities having been attended to, they drafted a letter to the Melbourne *Age* outlining their plans. The signatories were B.E. Cabena, T.D. Jarvie, (Ms) M. Carey, W. Ruffley, R.C. Sneddon and J. Moorehead.

Music Society

The letter was duly published and in September (1968) 50 people attended what became the inaugural meeting of the Music Broadcasting Society of Victoria. The elected officers were B.E. Cabena chairman, T.D. Jarvie secretary and L. Vermeeran treasurer.

In November 1968, Mr Jarvie returned to his native Sydney intent on forming the Music Broadcasting Society of NSW. Inaugurated in February of the next year, the NSW MBS reportedly set about building up its own separate membership and 'making its presence felt in appropriate places'.

It would have been about this time that Trevor Jarvie called to see me in the *EA* office, to outline Society plans for independent listener-financed music broadcasting stations. As I recall, it wasn't a very cordial session because, faced with his boundless enthusiasm, I could not but remind him of the conservative forces lined up behind the Huxley formula.

I was also aware of educational, community, church and other groups who were pushing for time or channels to promote their various objectives. In the climate of the day, I couldn't see the ABCB granting a concession to the Music Broadcasting Society which

Inside one of the 3MBS-FM studios as they are today. Note the compact disc players. (Courtesy B.E. Cabena)

would become an immediate precedent for other groups.

Problems notwithstanding, Mr Cabena recalls that the MBS group spent much of 1969 preparing a formal submission to the ABCB. By that time, the Victorian Society comprised 700 members with more than $4000 in the bank.

Their objective, at the time, was a special licence for an AM channel near the high frequency end of the MW broadcast band. The University of NSW had held just such licence since April 1961 (*R,TV & H* December 1962) but it was expressly forbidden to broadcast music. Now the MBS of Vic, the MBS of NSW and the University of Adelaide were all seeking AM licences – without the music ban.

Mission impossible?

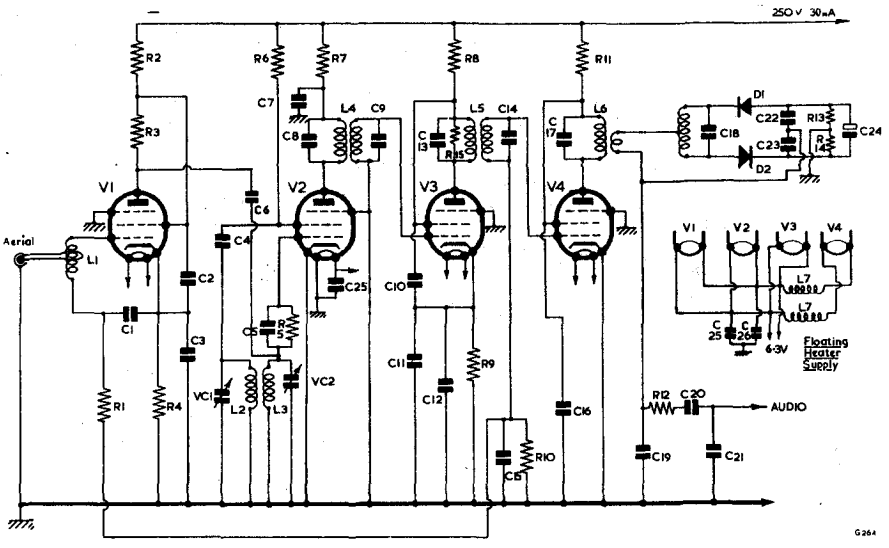
The Victorian application was despatched to the ABCB in November 1969, backed up by a personal letter to every member of the Federal Parliament with detailed information about the Society and its objectives. The Board replied in June 1970 and, in September, the Society received a copy of a further letter that had been addressed to Senator D. McLelland from the then Postmaster-General Alan S. Hume.

A copy of that letter, slightly abbreviated, is reproduced herewith. While reflecting the contemporary attitude of the Administration it also includes an interesting reference to FM – presumably in the UHF sector.

Having been refused an AM licence, the MBS group had no option but to prepare a further submission to the forthcoming inquiry into broadcasting services, which opened on March 1, 1971. At the same time, according to Mr Cabena, there was considerable doubt as to whether anything would come of it.

A Senate Standing Committee on Education, Science and the Arts offered a potentially more sympathetic audience when it set up a hearing into Television and Broadcasting. The NSW MBS had already had put its case, and Mr Cabena was invited to appear for the Victorian group in Adelaide in August 1972.

So also was the Adelaide University which, by then, had accepted a licence to operate an AM station (5UV) on 1630kHz. Because they wanted to use music bridges between program segments, PMG authorities had insisted that the high musical frequencies be filtered out to render it unacceptable as entertainment!



Reproduced from 'The Radio Constructor' (UK), this simple FM tuner circuit of the 1950's was intended for home construction.

But in December 1972, right in the middle of the game, the rules changed with the election of a Federal Labor government under Gough Whitlam.

After 23 years on the opposition benches, there were old scores to settle and new approaches to be implemented. They ranged right across the political spectrum, but in the realm of electronics and broadcasting Whitlam's ministers had no love for companies which, for decades, had been operating in a protected environment. And they had scant respect for the conservative officials who manned the administrative barricades.

FM reinstated

What was all this, for example, about grabbing the FM band for television and protecting AM broadcasters and local radio factories? Apart from anything else, it was at odds with the new Government's policy of freeing up imports.

An Independant Inquiry into FM Broadcasting was promptly set up under Sir Francis McLean, the former head of BBC research, and Professor Cyril Renwick, of the Hunter Valley Research Foundation.

To industry observers, the findings of the new committee were a foregone conclusion. McLean had seen Britain set up its new 625-line colour TV service on UHF, leaving the VHF FM band open for high quality stereo broadcasting. What more natural than his recommendations for Australia should be along similar lines?

And this they certainly were. Turning the clock back to the 1948 decision by the Chifley Government, the Whitlam government ruled that the FM band should be progressively cleared; that TV services should expand, or be redeployed as necessary, into the UHF bands; that new colour receivers – and by inference VCRs – should provide UHF coverage to ensure future compatibility.

The TV expansion/redeployment process is still going on, although less smoothly than had originally been hoped, because of technical and financial problems.

But, back in 1974, the urge was to support the decision with action – in short, to get at least token FM signals to air. What more fitting than to give the nod to the Music Broadcasting Societies which had been organising for years?

Mr Cabena records that, having represented the Society at all hearings, he felt reasonably convinced by January 1974 that they would get a licence – not on medium-frequency AM, but on the resurrected VHF FM band. He set about raising more capital and, by August of that year, working more or less alone, had assembled studio equipment and was addressing the design of a 2.5kW transmitter.

The invitation for the Melbourne MBS to apply for a licence came that September, in line with Mr Cabena's expectation. A similar invitation was extended to the Sydney MBS in the December – according to *2MBS-FM* magazine – much to the astonishment of Trevor Jarvie.

But the Sydney group were in the fortunate position of having on hand a couple of small stereo FM transmitters. The handiwork of Trevor Jarvie, Grahame Wilson and Max Benyon, they were originally intended to demonstrate FM stereo at the '75 Sounds Fantastic' hifi show (August 1974) and at other such exhibitions.

They were also fortunate in having a keen back-up group on call, and in obtaining an interim 2-room office in Alexander Street, Crows Nest.

When the okay came through, 'mid December' was nominated as the target date for the first transmission. This was set in official concrete when it was interpreted as December 15 and read into Hansard by the then Minister for the Media, Senator Douglas McLelland.

The office in Alexander St was transformed into a temporary studio, a makeshift antenna was erected on the roof and 2MBS became a radio station – with an output power of 15W!

Two weeks later, the transmitter was moved to the Telecom Tower in West St, North Sydney, and the power increased to 400W. On January 25, 1975 the stereo decoder was switched on and 2MBS became Australia's first FM-stereo broadcaster. Today, it is a modern 5kW public broadcasting station, well respected on Sydney's airwaves.

In Melbourne, according to Mr Cabena, they took a different approach. With a transmitter site available and a permanent studio, they determined not to go to air until they had a fully operational stereo broadcast facility, complete with record library and office system. 3MBS went to air on July 1, 1975 with a start-up power of 200W, which was increased to 4kW two months later – making them, at the time, the highest-powered public broadcaster on the air.

The two MBS groups had not only blazed the trail for listener-financed public broadcasting but, in the process, had also helped win back and populate the VHF FM band.

In due course, 2MBS in Sydney was joined by two other high-power public stations, 2SER and 2CBA (Christian Broadcasting Association), the latter of which had been supplying pre-recorded religious programs for years to AM stations around Australia. In Melbourne, 3MBS was joined by 3PBS and 3RRR – all on 10kW.

Since then, licences have been issued for public or community stations all over Australia, mostly FM and ranging in power from 20kW down to 10W for restricted local coverage. The January 1989 issue of *EA*, which is at hand as I write, lists 75-odd public FM stations, with more to come. It would probably not be too far from the truth to suggest that, behind them, are 75-odd stories of personal and communal initiative.

Not to be outdone, the ABC opened its official FM network in January 1986, based in Adelaide and with outlets in Melbourne, Canberra and Sydney. That was just the beginning; when the above-mentioned list was compiled, the number of AM outlets (101) had already been overtaken by their FM outlets (125) ranging in power from 150kW in Mt Gambier (SA) to a couple of 5W outlets at Galiwinku (NT).

The VHF FM band is up and running, in no uncertain manner.

The ultimate irony in all this is that the 13-odd commercial FM stations licenced to date have done so well that AM stations have been forced to upgrade to stereo, in an effort to compete. Moreover, as I write, several established AM broadcasters in Sydney are debating whether to tender megadollars for an alternative spot in the FM band!

As I forecast in April 1962: for a spot in "the very VHF band that they were once glad to see cut up".