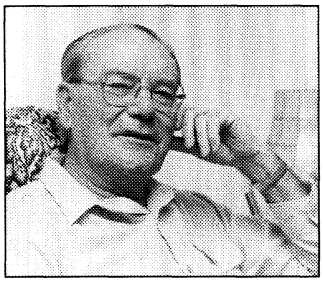

When I Think Back...

by Neville Williams

Victor Harris: A lifetime commitment to seeking top performance from analog discs - 2

Having addressed himself in the immediate post-war years to the design of professional quality phono pickups, Victor Harris helped set new world standards with his HH and MBH models, designed and produced in Australia. He carried through into the stereo era, meanwhile producing supplementary analog equipment well regarded by both professional engineers and the hifi fraternity.

. Because he was aware of their requirements and accessible as a local manufacturer, Vic had won ready support postwar from Australian broadcasting stations, recording studios, theatre operators and advertising agencies.

However, in a 1988 lecture to the Gramophone Society, Vic said that the arrival of stereo had signalled the end of his time-proven MBH leakage flux mono pIckups, described in the previous chapter. He had had to develop a completely new stereo pickup exhibiting comparably low stylus moving mass, low tracking pressure and a well suppressed natural resonance high up in the spectrum. To these basic requirements, it had been necessary to add high horizontal and vertical compliance, and complementary output signals for two separate channels — left and right.

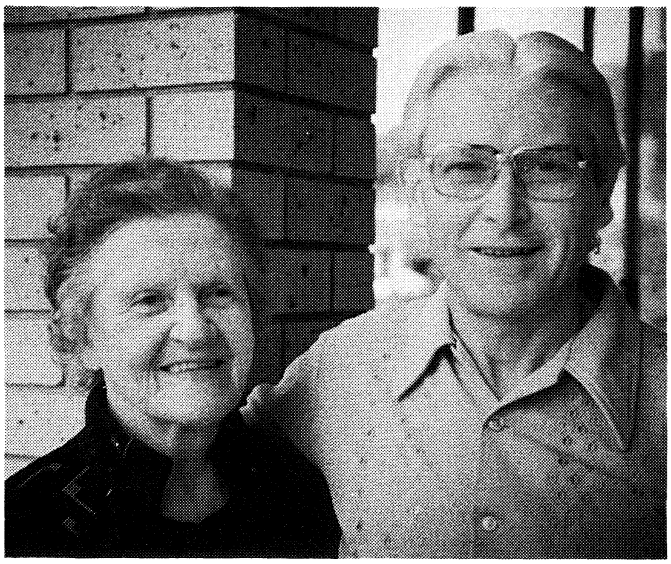

Fig.1: Vic Harris as many of his friends will remember him — just when he seemed to be gathering strength for renewed activities. He died suddenly on May 31, 1995, aged 77. His wife died only a few weeks later.

Surveying the scene, Vic said that some stereo designers had resorted to 'subterfuges' to disguise certain limitations — e.g. a too-prominent resonance peak, by using a cantilever with controlled flexing or specifying a capacitor across the output circuit. Such measures were not acceptable in a quality product.

To date, moving magnet or induced magnet systems seemed to have been favoured by most designers. Moving coil designs presented an inherent difficulty with high moving mass and tracking pressure, although Vic conceded that this last need not present a problem if kept below four grams.

Although his own leakage flux design had been eminently successful for mono, it was not a candidate for replaying stereo discs because the moving mass was not symmetrical: "For lateral movements", said Vic, "only about half the mass of the stylus is referred to the tip; for vertical modulation, the entire stylus had to be moved up and down".

Vic said that for new his MBH type-L stereo pickup he had opted for the moving magnet principle for the following reasons:

(a) It made for robust construction, in which the actual stylus assembly was the only vulnerable component.

(b) It allowed for ease of stylus changing.

(c) The coils could be completely sealed against corrosive penetration. This would not have been practical with moving coils.

(d) The output could be sufficiently high to obviate the need for step-up transformers or preamplifiers.

The magnet in the new MBH design (Fig.2) was a short bar which 'pivotted' in the middle of an elastomeric block. In effect, pivotting at the geometric centre of four pole pieces, it became a push-pull device; as one end of the magnet is approaching a given pole piece and receding from the opposite one, the other end of the magnet is doing the converse. He continued:

"The pickup is really like two pickups. The side pole pieces (not shown in Fig.2) sense lateral movements of the stylus, and the top and bottom pole pieces sense the vertical movements. Each pole has its own coil and the

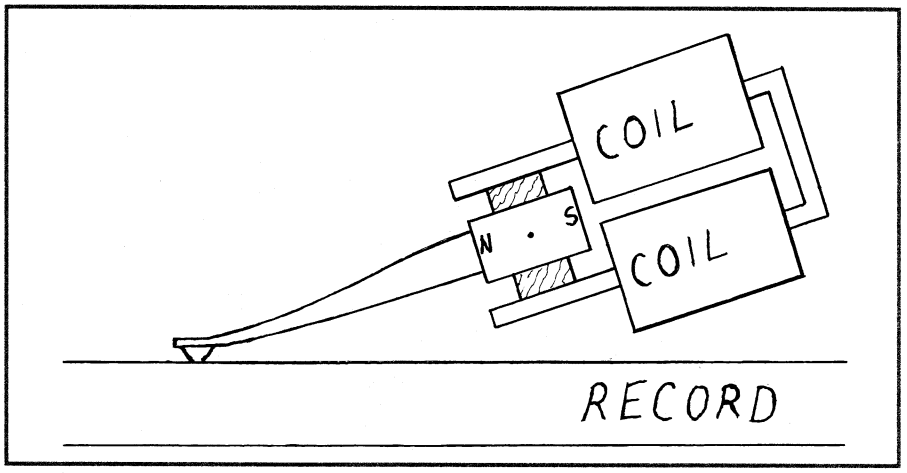

Fig.2: Adapted from Vic's own sketch, illustrating the operating of the Type L stereo pickup, relative to vertical deflection only. A second pair of coils and pole tips (not shown) sense lateral deflection of the stylus, with the two systems wired to produce left/right stereo signals.

method of interconnecting the coils — patented by MBH — yields the required sum-and-difference stereo resultants."

Explaining its physical construction, Vic told his audience: "The four coils and pole pieces form a composite assembly which is later encapsulated into the head. A square pocket is left in the moulding to accept the stylus assembly."

MBH literature quotes the vertical trailing angle as the (stereo) standard 15°, along with the option of two factory preset playing weights: 1.5 grams for extended stylus life, and a ruggedised version at 3.0gm. Either way, the response measures within +/-2dB from 20Hz to 20kHz, with no difference in the subjective sound quality between the two versions.

A spherical diamond stylus tip was fitted as standard, but an elliptical tip could be supplied to order. Vic was said to be wary of elliptical tips, however, because microscopic inspection of even prestige pickups revealed a problem: the tip was frequently misaligned relative to the groove.

In association with the Equidyne series arms, the type L stereo head climaxed the MBH pickup range which had been central to Vic Harris' career as a manufacturer of hifi equipment. (Subsequent variants were types -M, -N and -P).

A type L/M/N or P stereo head was the natural choice for private enthusiasts, who were as like as not to retain their mono heads for as long as they still had a use for their mono record collection. Such was the brand loyalty of MBH customers, according to Peter Stinson, that they rarely abandoned once-treasured older models, preferring to retain them "for old time's sake"!

Even before AM stereo broadcasting began, a few AM stations also installed MBH type L pickups to play new stereo library discs, rather than risk damaging them by playing them with a mono pickup. A miniature solid-state equaliser was developed by MBH (Fig.3) to blend the stereo pair into a mono signal suitable for feeding typical mono mixing consoles.

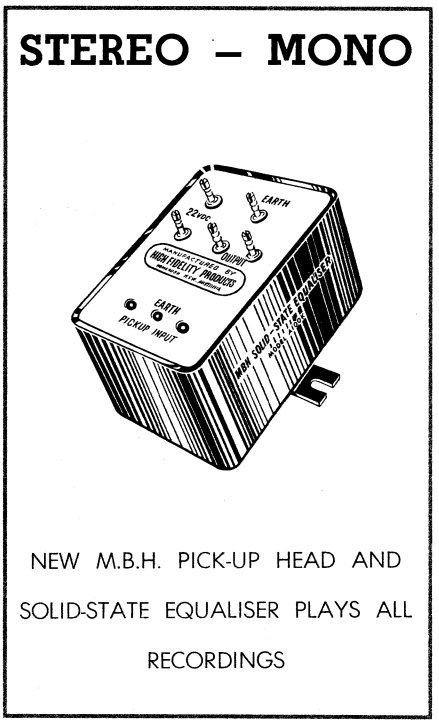

Fig.3: Tucked in under a motor board carrying an MBH Stereo pickup, this little solid state equaliser could deliver a signal switchable and correctly equalised for stereo or mono sound — from a stereo disc.

More than pickups

To this juncture, the Vic Harris story has been confined largely to phono pickups but there is much more to his overall hifi career, extending over at least 45 years.

In an article jointly prepared around 1990 for the Phonograph Society Magazine, Peter Stinson and Richard Dibbs said that Vic Harris had earned his right to comment on small-scale, precision engineering by his formal technical training and his ready acceptance by the Model Engineers Society.

Having also developed a keen interest in recording on acetate (lacquer coated) discs, one of his early observations from his one-man engineering business in 1946 was a criticism of certain imported recording lathes as being of 'sloppy design' with 'poor workmanship' and, by inference, overpriced.

Challenged to do better, he designed and produced a batch of recording lathes which have since become a valuable collector's item (see Fig.4). How many were in the batch is uncertain, but a couple of them have ended up in Peter Stinson's own collection of MBH memorabilia. Well engineered, Peter says, the recorder is assembled on a cast base and, while commendably firm and rigid, is in no sense cumbersome.

Having produced a satisfactory recording lathe, Vic Harris became acutely aware that there was a desperate need for a lightweight pickup — hence the Hummelstad Harris magnetic model produced in 1947 and described in the previous chapter.

Although produced as a spin-off from the recording lathe, the HH pickup was a unique product in its own right, which found its way into professional situations such as recording studios and broadcasting stations, nation-wide.

In turn, the need arose for matching transformers, equalisers and filters and who better to consult than the team who had produced the HH pickup? Vic Harris and Greg Hummelstad!

New factory

Ultimately, the garage-workshop proved too restrictive and in 1954, Vic embarked on the construction of a new

Flemington, making provision for three or four extra full-time employees. With the new factory came new trading names: 'High Fidelity Products' and 'MBH Audio Sales'. (The address was frequently quoted as Marlborough Road, Homebush West.)

While, on occasions, I may conceivably have driven down Marlborough Road, I have no recollection of ever having been conscious of Vic's factory — a modest brick building with the name in equally modest lettering above the front entrance.

What I have seen since is a set of prints showing racks, cupboards and shelves inside the building, stacked with test instruments, dies and tools which had been accumulated over the years as production aids.

The pictures had been taken, I gather, as a kind of photographic stock list of the equipment on hand. To me, they were mute evidence of a very tidy and methodical proprietor.

Settled into the new factory, Vic Harris had the satisfaction of knowing that his pickups and allied products had penetrated into about 80% of the local professional consumers, selling against Decca, HMV and other big-name products. In fact, EMI in the UK were using them to evaluate master recordings, and there were other inquiries about high performance turntables and complete free-standing studio playing desks.

To top it off, All-India Radio expressed interest in a complete MBH record playing system and having appointed High Fidelity Products as their principal supplier, bought several hundred turntable/pickup sets over a period of 10 years or more. In addition they bought a similar number of separate pickups.

Not surprisingly, there were also frequent inquiries for built-up amplifiers, on the assumption that an expert in pickup technology should be in a position to recommend or supply amplifiers of comparable merit. In fact, Vic Harris never professed to be an expert at electronics and tended to consult others before settling on a new design.

In their joint article, mentioned earlier, Messrs Stinson and Dibbs said that, when faced with the need for a new free-standing amplifier, Vic might typically select a leading-edge design featured in technical publications, such as an unusual transformerless circuit, one or other of the Mullard series, or the ultra-linear configuration, etc.

He would then discuss the claims and/or commission the services of people like Greg Hummelstad, Wal Buckland of EMI (Aust), Brian Beames, Craig Perkins, or Ross Sheard.

Having decided on the merits of the

Fig.4: One of Vic Harris' early recording lathes, in Peter Stinson's collection of MBH memorabilia. Note the on-board microscope and the identity plate, which identifies it as Model G2, by Victor Harris of Knocklayde Street, Ashfield.

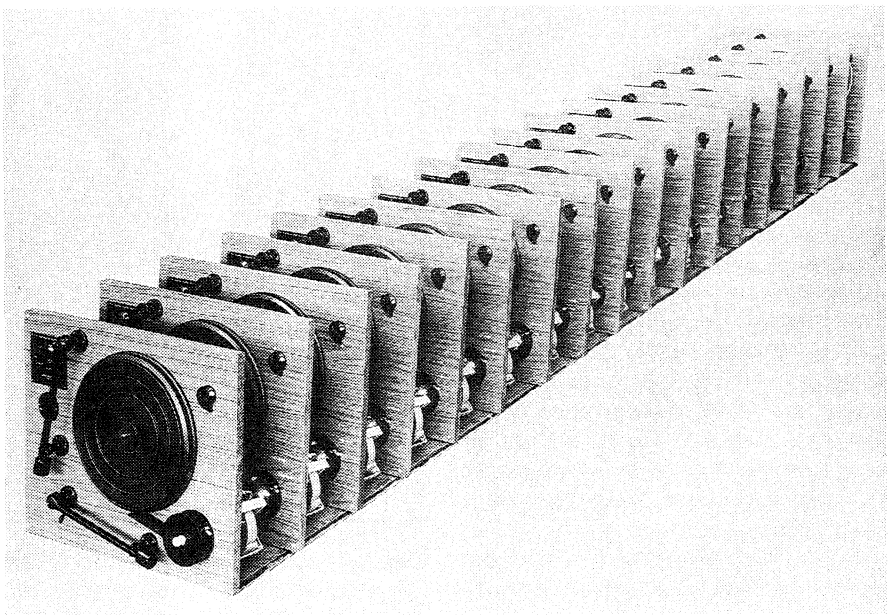

Fig.5: Photographed around 1965, a stack of studio disc players ready for despatch to All-India Radio. Keeping up with this contract probably limited MBH's penetration into the retail market.

particular circuit, adapted it as necessary and nominated the most reliable components, it and possibly a batch like it would be built up in the factory, under the MBH brand name, for sale to clients.

In the mid 1950s, Peter Stinson recalls, Vic became involved with a 'transformerless' amplifier featured in an overseas lab report.

Having in mind that the output transformer could arguably be the most expensive and the most contentious component in a valve amplifier, the prospect of marketing an amplifier without one was intriguing, to say the least.

There was just one problem: the amplifier in question wouldn't work; being — I gather — chronically unstable! Apparently, it had been lashed up in the aforesaid lab, without due attention to the power supply, having been connected instead to a benchtop lab supply with near zero internal resistance. Vic's team managed to sort out the problem, but the end result was still so expensive that only a few 'well heeled' enthusiasts could ever afford one. However, while MBH valve preamplifiers and amplifiers were listed in sales literature, they do not appear to have figured large in the factory throughput. The one thing certain is that they were styled in the Vic Harris fashion: neat but never pretentious, essential functions only, and with MBH cabling and connectors.

The mid 1960s saw a changeover to solid-state electronics in lieu of valves. Like many others, Vic had reservations at first about the possible effect on performance, becoming convinced later that quality was basically a matter of proper design.

More to the point, solid-state technology made it possible to house a complete high quality system in a cabinet formerly occupied by a control unit.

The Saraband system

From the late 1960s, private hifi enthusiasts were encouraged to consider the 'Saraband' ready-to-play unit, said to be 'free of gimmicks' and (I paraphrase) combining in one integrated unit the fundamental simplicity and quality of MBH components, each perfectly matched to the other.

To hand as I write is a brochure describing a stereo model Saraband, undated but obviously from the solid-state stereo era. It comprised a belt-driven turntable and stereo magnetic pickup, a stereo amplifier and control panel, housed in a free-standing, polished wooden case with a lift-up perspex lid.

Apparent options included a 12", or larger, Equidyne pressed aluminium arm, with anti-resonance felt pads and fitted with a quick-release head socket.

Fig.6: A solid state Saraband amplifier/record player. Produced around 1989, and intended for record collectors, it is fitted with a precision multi-speed turntable capable of playing 33/45/78/80rpm discs. It is provided with Equidyne arm, raise/lower lever and provision for interchangeable heads.

The arm also featured anti-skating compensation and a fluid damped vertical bearing.

The Saraband was normally fitted with an MBH stereo head, -L or later, set up ex-factory with a playing weight of 1.5gm or, if preferred 3.0gm, thereby offering an extra degree of ruggedness for slightly increased stylus wear. An 'Easycue' lever fitted near the front of the motorboard allowed the pickup to be raised clear of the record and lowered again, without fuss, into the same groove.

The belt-drive turntable motor was said to be the end product of four years of research, aimed at achieving performance figures equal to those of MBH professional models and considered appropriate for stereo replay. It provided for 33rpm only, on the grounds that the provision of other speeds could compromise the simplicity and performance to little real purpose.

(This decision was revised later when clients began requesting facilities to play their vintage 78s, etc.)

The S4002 amplifier fitted to the Saraband under discussion was one of the S4000 series of solid-state amplifiers which were accepted as appropriate for release in 1968. It had a power bandwidth from 25Hz to 100kHz of 20 watts per channel, with both channels driven in phase into 12-ohm loads. The THD was around 0.1%. The pickup input sensitivity was quoted as 3mV, RIAA compensated.

In a letter to hand from Ross Sheard, one of Vic's advisers, he says that the early Saraband amplifiers were assembled using Veroboard and, as such, did not lend themselves to quantity production. It fell to his lot to convince Vic that the amplifiers could be redesigned to advantage using IC's and conventional printed circuit boards — an area where Ross had gained considerable experience.

Vic apparently took a deal of convincing, not because he disagreed with the advice but because of 'a natural reluctance to change'.

All told, however, the concept of the Saraband added up to conservative hifi common sense, with none of the 'smoke and mirrors' exaggeration that has characterised the offerings of some ostensibly golden-eared hifi entrepreneurs.

Loudspeakers

As far as loudspeakers were concerned, Vic was said to have been partial to the once popular Barker Duode — 8" and 12" — which he initially imported direct from the UK for use in Australian-made enclosures. Later he began to assemble them from imported components and ended up importing only the 'soft' components and using locally produced frames and magnetic

systems. It is reasonable to suppose that Vic was making good use of the skills he had picked up as a production foreman at Magnavox Australia.

To hand is a brochure entitled 'MBH Loudspeaker Systems', as available from MBH Audio Sales, Homebush West. No loudspeaker driver brand names are mentioned, the inference being that MBH custom-built systems involved selected loudspeakers in an array of stoutly built enclosures and fitted with an exceptionally good — if expensive — divider network. Contemporary options included large free-standing enclosures, smaller enclosures with metal stands, panel systems to build into walls or partitions, and three tall, slim corner enclosures measuring 175, 142 and 122cm tall and from 45 to 55cm wide.

At this remote point in time the brochure reads as a rather routine document, seemingly proceeding on the assumption that if a loudspeaker system carries the MBH logo, it must be good! To me it lacked the conviction and the fervour of other MBH literature. Maybe Vic okayed it on an off day!

Trouble loomed

Unfortunately for Vic, there were clouds on the distant horizon which spelt more trouble for him than he could possibly have foresee.

First off, planning for a new City-West expressway and feeder roads had long since threatened to absorb the land on which the relatively new MBH factory stood. According to the RTA — or was it the DMR in those days — the site was to be resumed and one day in the foreseeable future, the bulldozers would move in to clear the way for a new road.

Vic was understandably dismayed, and began to work out what he might do about it. A site adjacent to a rail facility seemed like a good idea, but nothing suitable was forthcoming. At the other extreme, he began to think in terms of a workshop/dwelling in the Manly-Warringah area; but again, without result. Fifteen odd years later, the worst still had not happened and Vic soldiered on in the fervent hope that the road project would be delayed still further by political argument.

In the same period, I gather, Vic had staff problems arising from accident and/or sickness. Production fell behind schedule, and the arrangement with All-India Radio lapsed. Under the strain, Vic's own health faltered.

As a result when the final notice did arrive, Vic was not able to execute the move in the way he would have preferred. The contents of the factory were to have been systematically transferred into cases and cartons, each numbered and with their contents carefully documented.

Instead, as it turned out, it became a race to get the contents out before the bulldozers pushed the walls in. Indeed, it was even worse than that!

Peter Stinson was involved because, over the years, he had built up a close relationship with Vic Harris. Interested in hifi since his school days, Peter had subsequently stumbled across the MBH brand name and progressively inherited several old pickups — HH and MBH B type, etc — and a couple of old valve amplifiers.

Vic was vastly intrigued when Peter turned up at the factory with first one, and then others. Instead of politely dismissing his inquisitive young visitor, he took time off on each occasion to tell him about 'the old days' and help restore his treasured acquisitions to working order.

Ross Sheard tells how, in the 1960s, he (Ross) had set up his own disc recording studio but ran into strife when the drive/feedback windings in his Westrex disc cutter were accidentally burnt out. He searched Australia in vain for someone who could help him out, until Vic Harris finally volunteered to 'have a go'!

With infinite patience, Vic removed the burnt-out windings and replaced them by hand, the feedback winding in particular involving wire that was difficult enough to see, let alone handle. The restored head worked as well as new.

Some time later, Vic agreed to let Ross Sheard set up a couple of disc record presses in an annex — 'the shed' — at the rear of the Flemington factory. In the context of MBH it was massive equipment involving steam heating, screw-type extruders and pressures up to

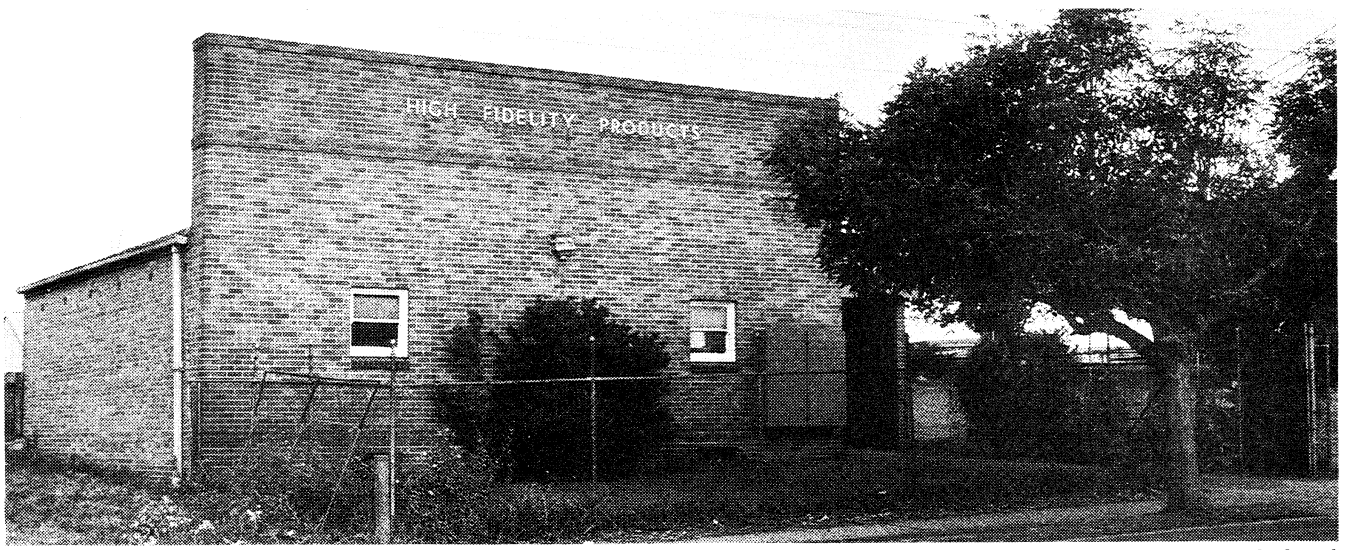

Fig.7: The MBH factory at Flemington, an industrial suburb about 10km west of Sydney. Unfortunately, it occupied a site earmarked for an access road. Not visible here, an annex at the rear housed a record pressing plant operated by Ross Sheard.

3000psi; but, says Ross, Vic took the same intelligent interest in the equipment as he had in the micro-engineering required to build pickups.

Over the following years a million-odd pressings were produced under contract in the Ross Sheard annex, and the two men took considerable interest in each other's activities. And that, I gather, was Vic's style — and the reason for the immense amount of goodwill that was evident amongst the hifi enthusiasts who had dealings with him.

It was also the reason for Richard Dibbs' remark quoted last month, that Vic was too much the obliging (analog disc) enthusiast ever to make a lot of money (for himself) out of his chosen career!

When the time came to move there was no lack of concern for Vic's welfare, but no-one could have anticipated the shattering course of events.

As Peter Stinson tells it, as the ground for the new road was progessively cleared, the HiFi Products factory was just about the last building to go, "standing forlornly in a wasteland of debris".

It was too much a temptation for vandals, who broke in one night in search of anything they could 'flog'. Instead, as they ransacked the shelves and cupboards, they found mainly jigs and dies and (to them) useless tools and instruments.

The filing cabinets were full of equally useless papers, so they piled the papers in a heap and set fire to them.

Utter chaos

Morning revealed a scene of utter chaos. The combustible contents of the factory had burnt, the roof had partially collapsed and much of the front brick facade was a pile of rubble. Buried amongst the bricks and the ashes were the remnants of what had once been a specialist hifi equipment factory.

Vic was in a virtual state of shock, but a number of members of the Phonograph Society rallied to help collect and sort the smaller items while others tackled and transported the heavier items like lathes into 'storage' — which usually meant the Harris family garage at Beecroft.

Vic gradually sorted himself and while hindered by the loss of his engraving and injection moulding facilities, he was able to assemble the occasional record player system, and to undertake essential repairs to pickups, loudspeakers and amplifiers. It certainly kept his former customers happy and, at his age — 70-plus years — Vic seemed content to work at that level.

Around 1994, he bought a house in Balgowlah, in the Manly area, sold the home at Beecroft, and set about transferring his technical equipment to the new site.

It proved to be a major project, complicated by his wife's recurring health problems and the need for a fair amount of renovation to the property. Once again, help was forthcoming from the Phonograph Society but says Peter Stinson, just when he seemed to be gathering strength for a new phase of activity, he died.

Sad enough for his family, Vic's death was also a bitter blow to members of the Phonograph Society. To them he was a vital link with a mutually treasured, century-old technology which had quite suddenly been superseded.

Prior to his death, they had been grateful for his intention to provide technical maintenance for their MBH equipment. Apparently there had also been some discussion about sharing his techniques with some of their technically inclined members, against the day when he might no longer be able to carry on. But suddenly he was gone, along with his pre-disposition to mechanical precision relative to analog audio technology.

Which brings me back to where this story began. During the course of Vic's career, other generations of mathematically inclined engineers, developing computer technology, had come up with techniques for manipulating numbers with incredible speed and accuracy.

Quite suddenly — within the past couple of decades — the need to record the actual shape of an audio envelope had been obviated. Instead, its instantaneous value could be precisely measured at supersonic intervals and recorded on tape or compact disc as an ongoing sequence (torrent?) of encoded numbers (measurements) — the 'digital' technique.

In digital form, the signal could be checked, timed and copied as many times as necessary without loss of quality or build up of background noise. Nor, assuming the use of crystal-locked hardware, was there any risk of wow and flutter.

And, given the use of a sufficiently high sampling rate — e.g. 44kHz — and an adequate measurement range, the train of digits could/can be converted at any stage back to the original waveform with a potential response flat from the sub-bass range to over 20kHz, and a dynamic range and noise headroom of around 100dB. All of this without any audible artefacts.

In short, the digital system offers, as a matter of course, a standard of performance which the exponents of the all-analog system could only dream about. My guess is that Vic Harris passed on, not bitter but knowing that in his time, he had helped push the analog system to its commendable limits! ❖

Fig.8: A sad sequel: the MBH factory, after it had been ransacked and set ablaze by vandals in mid 1990. Vic sought to re-establish his activities at a 'retirement' level, but time ran out for both Vic and his wife Mary.