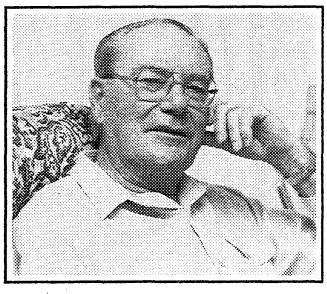


When I Think Back...

by Neville Williams

Harry Mauger - 2: Photographer, radio technician, amateur, soldier and recording engineer

In the first of these articles, we looked at the early part of Harry Mauger's career. Here we take up the story in 1956, at the start of the microgroove LP era. Harry was now the Technical Manager of Astor/Mercury Records, and he found himself responsible for setting up the company's new record plant at Huntingdale.

At this point, it is appropriate to remark that, in collating last month's instalment, I learned a great deal more about Harry Mauger — pronounced 'Major' — than ever I had gathered from my hurried business trips to Melbourne. On such occasions, by the time we had discussed matters of immediate mutual interest, it was time to head off to the next appointment! There was little opportunity for getting-to-know-you reminiscing.

Such being the case, I must confess that I didn't fully appreciate Harry Mauger's dedication to the job in hand, or that of the Astor/Mercury team that worked with him. In Sydney, by contrast, we were actively aware of personalities in the local Columbia/HMV/EMI group, with their worldwide affiliations, their established facilities at Homebush and their new high-tech music studios in Castlereagh St, City.

With hindsight, it would now appear that the Astor/Mercury team was no less committed to the production of technically commendable recordings — although, for the most part, with little in the way of overseas support.

The team had demonstrated its ability to make records — and money — in a supposedly 'tin shed' at Richmond but, as the focus shifted from 78rpm discs to microgroove, the need became evident for improved facilities and conditions. In 1956, management agreed to establish a new plant, especially designed for record production. This was at Huntingdale, across the road from the Anodeon valve factory, in which Astor held an interest. By then, Charles Gendle had retired and Harry Mauger had become Technical Manager.

Harry says that production of records on the anticipated scale required lots of steam and also lots of cold water. Fortunately, the new factory could buy steam from the Anodeon factory, which had installed a large boiler to heat water for washing TV tube glass. To gain access, however, Astor/Mercury had to run a supply pipe operating at 100 pounds per square inch, under a public road.

They were not allowed to dump warm water, heated after cooling the dies, nor could it be redirected into the copper pipes of the boiler. As a result, a 16-ton refrigeration plant and cooling towers had also to be installed, to cool it for re-use in the presses. As Technical Manager, it was a sore point with Harry that they were paying good money for electricity to heat water and cool water at the same time!

There were 12 presses in all, each capable of producing around 1000 disc records per day. They were positioned in the factory to obviate the need for right-angle bends in the supply pipes, and thus minimise 'ventura' effects. (For those of us who are unaware of such matters, Harry observes that "steam at high velocity is almost as fussy as RF in transmission lines...")

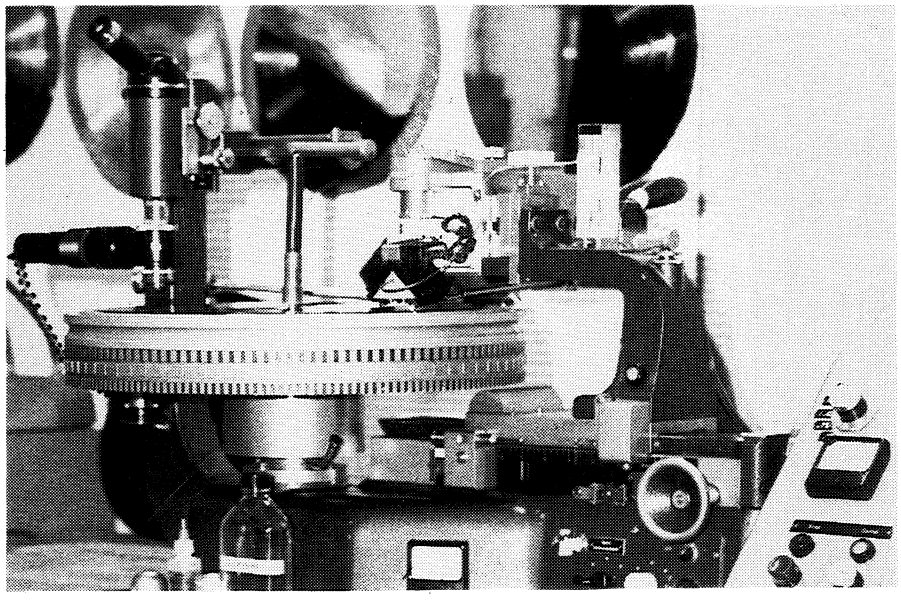


Fig.1: The Neumann Recording Lathe, still in use in the Clayton factory when it closed down — a ZT32S, modified to incorporate a SX74 helium-cooled recording head and a solid state drive system. Note the groove inspection microscope at the top left, poised above the turntable.

As they came off the presses, all discs were visually inspected before packing and at least one in every hundred was auditioned in a sound- proof room — a luxury after the all-pervading traffic and production noise at the original Richmond premises.

World-class equipment

In due course, with hifi stereo having taken over, the time had come to pension off the original Connoisseur lathe. This was replaced with the latest Neumann recording lathe and cutting system — the first of its kind to be imported into Australia. It was purchased complete with amplifying equipment — still valve based in those days — and a Studer C37 tape system. All of this was regarded at the time as the 'Rolls Royce' equipment of the record world.

Says Harry Mauger (my precis): "A story must be told about this first Neumann. As supplied, it came with a handbook and instructions in German. But although we had two German employees, they could not cope with the technical terminology. We managed to extract a 'short list' in broken English on how to set up the cutter, which turned out to be a complicated procedure requiring the negative feedback to the cutter to be adjusted methodically to avoid burning out the windings."

"It involved advancing the level slowly, until the meter on the panel read 100mA. The trouble was that the aforesaid meter was calibrated in 10 steps between '0' and '1' with no other markings. We took a punt and brought it up carefully to full scale. What we didn't discover until later was that the meter was set up to read 0-1 amp!"

"I had the job of going cap-in-hand to the General Manager, to confess that we had burned out the new $5000 head without ever having recorded a note. The repair cost us $1500, a couple of months delay and some very red faces!"

"Fortunately, once we had become familiar with the equipment, Bob Morrison did wonders with it and for our Company reputation."

Astor finished up cutting virtually all of their own Masters locally, thereby minimising reliance on imported counterparts — which they found to have more than their fair share of clicks, plops and overcuts. At this stage, the company was pressing over 20 labels, including Vanguard, Mercury, Electra, Pye, Audio Fidelity and Hi Fi, plus local productions on the Astor label produced in the studios of Channel 9 TV. There were also lots of limited-run custom pressings.

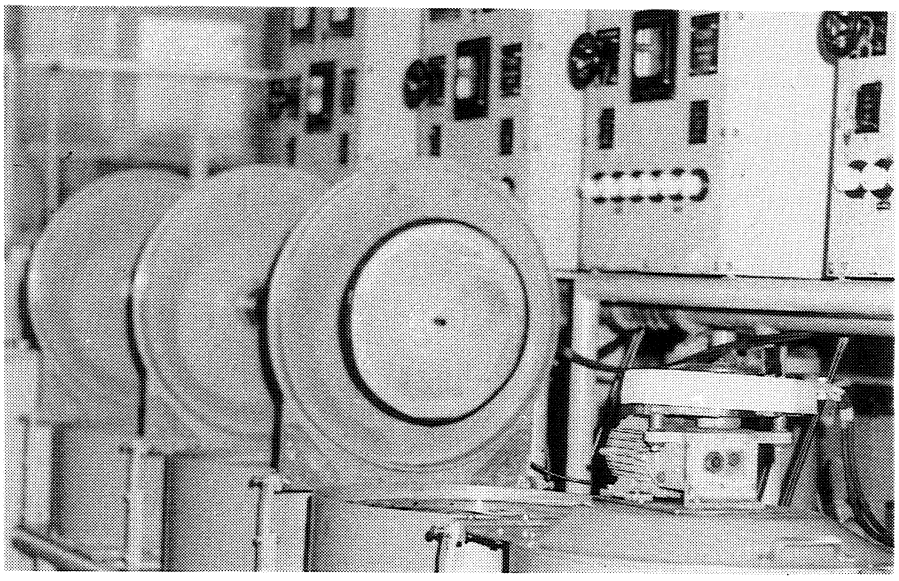


Fig.2: The line of Ortofon Plating Equipment. When the picture was taken, only the tank on the extreme right was actually working.

As an aside, Harry mentioned that the production arrangement with Channel 9 exposed an element of friction between Mercury staff and the Station's own operators, who were formally licensed Broadcast Station operators. To forestall the demarcation, Harry sat and qualified for the relevant professional 'ticket'. Having done so, he also sat for and passed the requisite Morse code test to gain his amateur licence — a useful bonus for retirement!

He was duly issued with the callsign VK3KAE but what little time he could devote to amateur activities at that stage tended to be absorbed in fiddling with equipment and DX listening, rather than actual transmission. Along the way, he also became a member of the IRE (Institution of Radio Engineers, Aust) — now the IREE (Aust.).

State of the art

Getting back to his occupation, the Neumann/Studer mastering system could be set up to cut discs at half speed, to minimise possible transfer difficulties at the higher frequencies. Special Pultec equalisers had to be used to compensate for the 2:1 downward shift in the apparent frequency range. Despite the extra setting-up and the longer transfer time, half-speed mastering was frequently specified by clients from 1960 on-

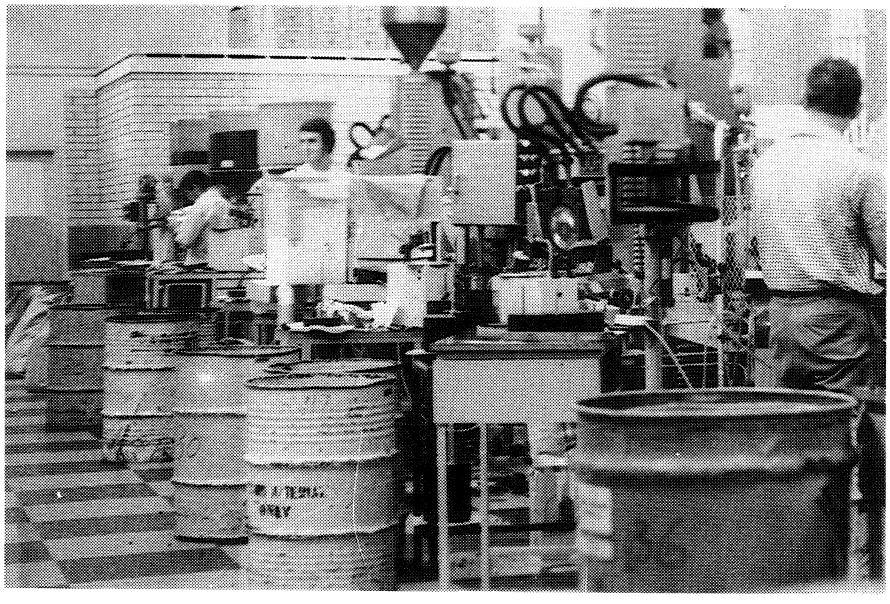


Fig.3: Three units of the press line at the Clayton factory. Harry Mauger's deep regret is that equipment like this, and the local operator know-how have been relegated to history!

wards, in the quest for the 'ultimate' in sound quality.

The equipment was also notable for the fact that the lathe included automatic pitch variation, cued by an extra pre-signal read head fitted to the tape deck. In fact, the original Studer deck was still in use when Harry retired in 1980.

During this same period, Astor were also producing 7-1/2ips open reel consumer tapes at Huntingdale, dubbed from 1-inch masters on Ampex duplicating machines. The quality was first rate, but the format was too cumbersome and too expensive to compete successfully in the consumer market with LP discs.

Predominantly, the Huntingdale plant churned out discs at a huge rate until 1968. The one activity missing from the complex was plastic milling, occasioned by the fact that there were two alternative suppliers. As well, technology was changing to the use of extruded granulated plastic; this involved the substitution of new imported presses for the faithful old Johns equipment.

By about 1968, following a buy-out by Philips, most of the original Astor Company activities had been transferred to the Philips Clayton site and it was duly decided that the Huntingdale record facility would also be re-sited. Management decided that the job was to be done 'properly', resulting in what was probably the most modern factory of its kind in Australia.

Harry says that the new Clayton factory was divided into four main sections. At the rear was a printing plant that produced all the labels and jackets for the discs, along with literature and packaging for the new Philips tape cassettes, which were also 'taken aboard', in lieu of the earlier 7-1/2ips open-reel tapes.

Factory layout

The second section contained the matrix plating facility, equipped with Danish Ortofon plating equipment (Fig.2) — the best in the world at the time, and broadly similar to what is currently being used for CD production. The dies were of nickel, which was significantly tougher than their copper equivalents.

The third section, housing the pressing plant was totally air conditioned, with an impeccable blue tiled floor, with all water and steam pipes run underground (Fig.3). The plant itself comprised a dozen Swedish Alpha presses, fully automated and fed with Alpha extruders that fed the correctly heated and weighed plastic.

The plant and installation was equal to the best in Europe, as also were the working conditions for the staff — and for the products. Harry adds that Alpha still make most of the pressing equipment used for compact discs. Section four, also air conditioned and dust sealed, was set aside for the production of tape cassettes. It was equipped with Ampex high-speed duplicators and automatic loading and labelling machines. More about that in a moment. In all, the Clayton factory contained three sound-isolated rooms, one of which was used for Master cutting. It was equipped with current Neumann recording equipment, complete with amplifiers, groove and depth control system, equalisers and audio control desk.

Cutter heads were replaced every few years, thereby keeping up with both wear and tear and evolving technology. The cutters were helium cooled to permit high recording levels without heat overload in the windings.

Another of the sound isolated rooms produced the 1-inch masters for cassette production, using Studer and Ampex machines. It involved dubbing two stereo tracks, side by side, one in the reverse direction, as per the cassette format. To mark the start and finish of the overall cassette program, the masters were cued with six cycles of a particular audio tone.

Cassette production

For the actual cassette duplication process, the 1-inch cassette master or source tape was loaded into a 'bin' with start and finish joined, to form an endless loop which could thereafter be cycled continuously through the replay deck, carrying the program plus the 'start-finish' cue tone.

From this source tape, the contents were dubbed on to cassette format tape stored on 12-inch (30cm) reels which therefore finished up with a large number of complete cassette programs, bulk-recorded end to end but separated by start/finish cues. These reels were then placed on an automatic tape loading machine with a hopper full of 'C-zero' cartridges — normal cassette cartridges with only a short blank leader/trailer tape joining to the two spool hubs.

The equipment would monitor the tape coming off the 30cm storage spool and, prompted by the cue, would slice the leader at mid point, slice the bulk-recorded tape and automatically splice the two, thereafter diverting the recorded tape into the cassette. At the next cue, the procedure would be repeated to slice the feed tape, splice the end to the leader/ trailer, take up the slack and drop the now functional cassette into a bin ready for packaging.

Harry says that they used German tape for the cassettes — presumably BASF. The C-zero cartridges themselves were variously made at Clayton, imported from overseas, or assembled elswhere in Australia. In fact, he says, the plant became something of a showpiece and, with Frank Hulbert and the Neumann producing the Masters, and pressings by courtesy of Ortofon and Alpha, they ended up cutting and pressing most of

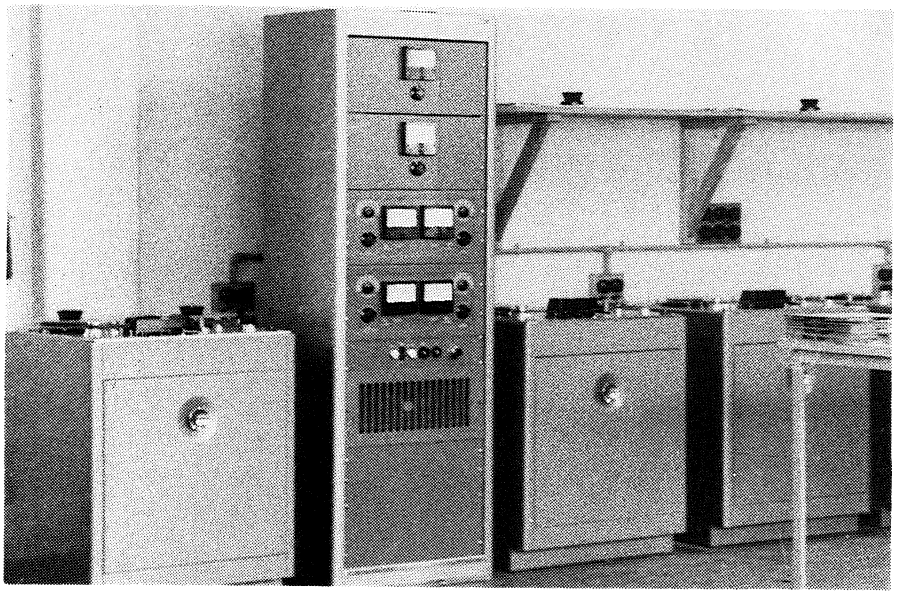


Fig.4: Some of the tape duplicating equipment at Clayton. Once set up, the tape cassette production proceeded automatically, requiring only occasional operator intervention.

THE STORY BEHIND AUSTRALIA'S FIRST DIRECT-TO-DISC STEREO LP.

In the 78rpm era, performances had, originally, to be recorded direct to a master disc. Unacceptable faults could only be eliminated by repeating the exercise — which, fortunately, wasn't too much of a problem with sides lasting a mere three to four minutes.

The introduction of tape masters reduced the pressure on engineers and performers alike and, in practice, the flexibility of tape mastering made LP discs practical on a large scale.

In the 1970's, however, dedicated hifi purists began to question the presence of a tape link in the recording chain, along with the use of complex microphone and mixing techniques. In response, specialist recording companies set about making promotional D/D (Direct-to-Disc) recordings for sale to hifi devotees.

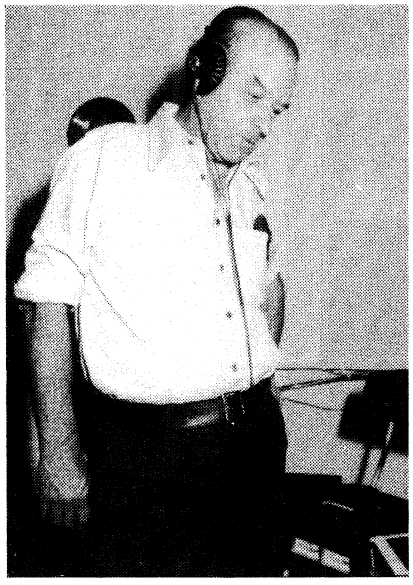
Astor/Mercury released just such a disc, as featured in our August 1978 issue, in collaboration with Jazznote and the then World Record Club. Behind the initiative was jazz old-timer Harry Mauger, recording engineer Frank Hulbert, President Max Hawton of the Audio Society (Melbourne) and veteran Audio Engineer Max Hull.

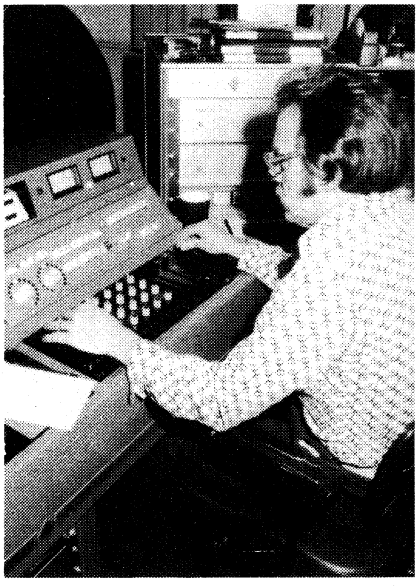
To do so, they had to adapt one of their soundproof rooms for use as a studio, linked by audio lines direct to the cutter control desk. They also had to locate a small professional group prepared to commit themselves to two 15-plus-minute segments, without 'fluffs' and with only brief pauses between the items.

Agreement was duly reached with the Steve Murphy Quartet, with Steve Murphy on Hammond organ, Jack Gay on electric guitar, George Aylor on drums, and Maurie Sheldon on electric bass. To minimise the intrusion of instrumental loudspeakers, splits were available from the source amplifiers.

The result was 30-plus-minutes of what Harry Mauger described as 'free-wheeling jazz', offering very good sound quality. Whether it was subjectively better than what would have been available using a tape link, he was not prepared to say. In effect:

"As you would expect, the sound is very good. But it could only be rated better than a tape mastered version if it is shown to be free from discernable artefacts that would characterise the latter. One's reaction otherwise is based primarily on one's rapport with the program contents"!





At left, Harry Mauger, Astor Pressing Plant Manager, listens to the audio mix of the disc "The Steve Murphy Quartet Direct". At right, Frank Hulbert, Cutting Engineer at the Melbourne Astor Plant keeps a watchful eye on the stereo balance being fed to the SX74 cutting head.

the records by local artists, as well as highly commended work for prominent overseas labels.

On one occasion, he recalls, they had a lunch appointment with a very famous overseas artist and his manager. At 10am on the day, the manager handed them a Master tape. At 2pm, after lunch, they handed him back a pressing! He was amazed and was heading back to Britain 'to have a few words' aimed at getting their own production people off their butts!

End of an era

In 1975, Harry Mauger had a slight stroke which, if nothing else, warned him of the passing years. He retired in 1980 but, as it happened, he didn't miss much in terms of the analog era.

Just as microgroove records had swept aside the solidly entrenched 78's around 1960, 20 years later they suffered the same fate from the digitally based compact disc. From being a showpiece for the Philips group, the Clayton factory was shut down in 1981 — leaving Harry Mauger, the old-timer from the days of Eclipse and Astor, with an interesting assortment of quotable memories.

"Towards the end of the era", he says, "there was a resurgence of enthusiasm for running Master tapes at 30ips, or even eliminating tape altogether and recording direct to disc.

Back in the old days, recording engineers had *no option* but to record direct to disc, even for 15-minute broadcast transcription work. When tape did arrive on the scene, European engineers in particular initially favoured 30ips because the slower speed technology at the time was barely equal to the task."

"Cyril Stevens of Spotlight Variety Records (Melbourne) always used 30ips Masters, but he preferred to record performances in his own studios direct to disc. He used to say 'They sound better'!"

"I still have one of his records of the Ballarat Choir, which I believe was the first all-Australian stereo record, mastered by Cyril at 30ips and cut and pressed by us. I played it recently and it still sounds great!"

"Early in the LP era, we were using copper dies (stampers) which had a bad habit of stretching (becoming 'off-centre') and of splitting along the run-in groove. We switched to nickel and sulphamate nickel, immediately after its introduction in Europe."

"We also developed a method of lowering the cutter inside the groove guard bulge, to further minimise splitting. Eventually, Neumann took up the idea and incorporated provision for it in their lathe."

On-the-nose plastic

"There was considerable controversy over plastic — the local product versus imported alternatives. Personally, I only ever found one overseas plastic that gave better moulding and better sound than the local product. But — the staff refused to use it because it gave off a horrible smell when heated! It was technically excellent but of no stinking good!"

"In everyday practice, I found that a deliberate mix of good re-used plastic with virgin plastic in proper proportions moulded better than the virgin plastic by itself, having superior flow characteristics. But, virgin or mixed, most of

the problems experienced with plastic were attributable in the ultimate to overheating or burning."

"When cutting masters in stereo, any out-of-phase causes the cutter to rise out of the groove, such that the cut can become sufficiently 'thin' to aggravate groove skipping. The Neumann lathe had both automatic depth and pitch control to counter this problem."

"In practice, incidentally, towards the inner grooves of an LP disc, the track tends to revert to mono below about 100Hz. No matter — it's hard to set up independent 50Hz wavefronts in a living room. "Most clicks and plops occurred in the plating process. We played our Mother Matrix — they can be played with a normal top quality pickup — for purposes of quality control. As part of the equipment, we had a stereo microscope for groove inspection and the means to physically engrave clicks out of Mothers. This, in fact, was standard practice in most record factories." (Acoustic microsurgery?)

"Due to the rising frequency compensation adopted for LP disc recording, a lot of power was necessary to drive the cutter to the requisite velocities at the top end of the spectrum, especially when recording repetitive highs, as for a rhythm cymbal. Overheating and burnout of the cutter windings was a daunting and expensive occurrence."

"Quite early in the history of LP recording, the idea was adopted of pumping helium through the cutter winding assembly to combat heating, while signal limiters were also devised to automatically keep the signal drive within the AES curve. Even so, 'virtuoso' panel operators in the studios often had to be reminded not to overemphasise the high frequencies."

Retired, but busy

Okay, so what *does* a retired recording engineer do in his spare time? Well, Harry is still a member of the IREE and he's still an active amateur — indeed, rather more active on the bands than in earlier years.

He's still interested in photography, too, and as opportunity permits, still adds to his colour slide collection featuring native fauna. In addition he's interested in black-and-white photography and has his own private darkroom. For extra measure, publicity about Halley's comet triggered an interest in astronomy, and his cameras now peer on occasions through his own home-made telescope!

As a corollary to a lifetime of rambling through the bush, Harry has also collected his share of gemstones, which he has learned to cut, polish and mount.

And, as for mental stimulation, Harry is associated with Melbourne's University of the Third Age, where he joins several hundred other people — mostly to listen, but sometimes to lecture.

Last but not least, I put a question to him as a man who had spent much of his adult life listening critically to original musical performances and recordings thereof: What was his reaction to the talk about the relative 'musicality' of analog and digital recordings?

Without hesitation, he professed to having little sympathy for the proposition, attributing it mostly to 'sound they have grown used to' and an emotional attachment to particular performances associated with particular equipment.

Out of the discussion came the point that, throughout the analog era, a certain degree of satisfaction — technical 'fun' — has been derived from being able to seek and win marginal improvement by personal attention to detail and/or saving up for a more expensive this and that. Phono decks, cartridges and stylii were a case in point.

With digital technology, most such electro-mechanical limitations have been excised at one stroke and there simply isn't the comparable scope to effect improvements at a personal level — within the sensory limits set by human ears.

It would seem, however, that many people are unwilling to accept the proposition that here is a disc or a tape and a player that can deliver an audio signal that is much flatter, cleaner and quieter than one's own senses.

People still want to believe that they can go one better by trying a little harder or buying a more expensive model. And what supplier is going to dissuade them? Harry says that he has a high regard for CD records and has collected quite a few, but he can still listen to and enjoy LP records that have been produced and/or reproduced with 'blood, sweat and tears'!

"In fact", he concludes, "When I look back over the complex mechanical and electrical problems that have to be tackled in recording music by any format, I cannot but marvel at how close we've been able to get to the original."

Having just listened again to the Astor/Jazznote direct cut, I won't argue with that! ❖