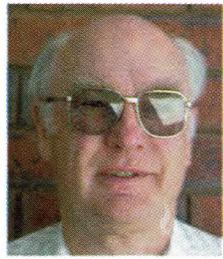


VINTAGE RADIO

By RODNEY CHAMPNESS, VK3UG



The Hellier Award; Pt.1

Building simple valve radios from scratch can be a challenge and a lot of fun. Eight such radios were recently built by members of the Vintage Radio Club of North Eastern Victoria as part of a competition. All used just two valves but with lots of interesting variations.

Back in 1989, when the Vintage Radio Club of North Eastern Victoria Inc. was formed, one of its aims was to foster a cooperative spirit in various areas of vintage radio – eg, education, restoration and the collection of historical information on our radio/wireless heritage. In addition, as part of the club's activities, a competition has

been conducted almost every year with a different emphasis each time. These competitions have included: building a 2-valve radio, restoring a wreck (and plotting your progress), building a "Little Jim", building a "Little General", building a useful piece of test gear and building a crystal set (Silicon Chip, October 1994), etc.

This competition is known as "The Hellier Award" in honour of Les Hellier, one of our early radio broadcasting pioneers. Les Hellier established the first country-based broadcasting station in Victoria (and possibly in Australia), according to the club historian. That station was 3WR Wangaratta, which later became 3SR Shepparton on 1260kHz. 3SR has since closed down on the AM band but the transmitter is now operated by the racing fraternity.

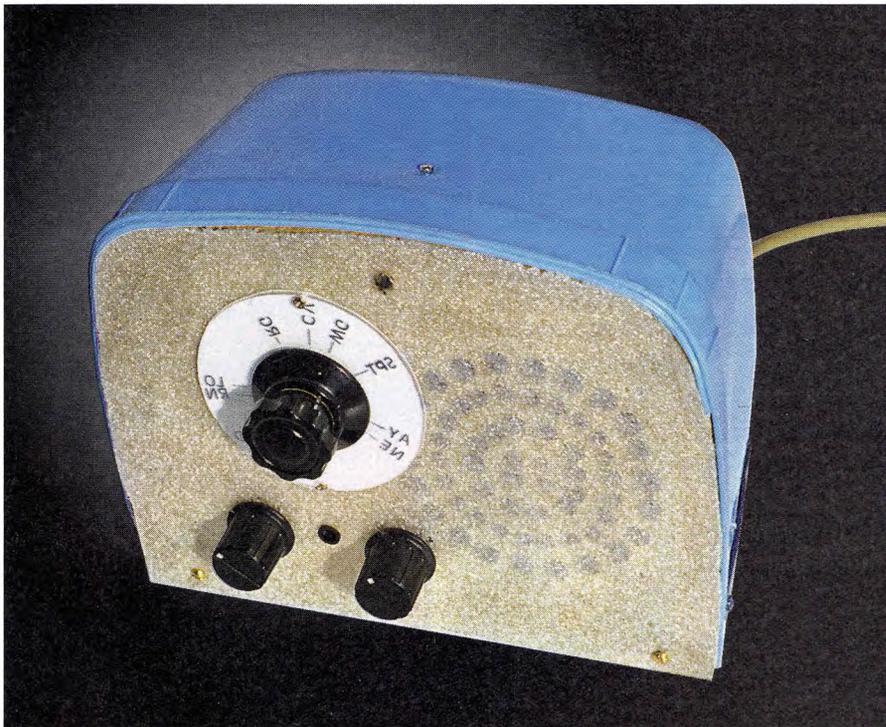
The last Hellier Award

Back in April 1998, I proposed that the award should be for the construction of a small 2-valve (envelope) receiver – basically, a radio somewhere between a "Little Jim" and a "Little General" in complexity and performance. These sets appeared as constructional articles in "Radio & Hobbies" over many years and were built by enthusiasts between the late 1930s and the early 1960s.

For those unfamiliar with these sets, the "Little Jim" was a 2-stage radio with a regenerative detector and audio stage (usually using a twin-triode valve). By contrast, the "Little General" was a more ambitious set, being a basic superhet with a converter, an IF stage and an audio stage.

I proposed that perhaps the award for the year could be called the "Big Jim". The name didn't get off the ground but the concept certainly did.

As for the technicalities, the valves could be single function such as a 6V6GT or multi-function such as some of the "Compactrons" that have up to three valves in the one envelope. Rectifier valves, if used, would not be considered in the valve count. The aim was to stimulate the members into looking at all the areas of importance in the production of a set and to



This little 2-valve TRF set had most of its cabinet made from a 2-litre ice-cream container!



This photo shows the eight entrants for the 1999 Hellier Award. Five of the sets are simple superhets, while the other three are TRF sets.

really let their hair down and do something innovative if they wanted to.

Key parameters

The set was to be a mantle unit suitable for use in the kitchen or a bedroom. Some of the key parameters were: (1) it had to be easy to operate, (2) it had to be pleasing to look at and (3) it had to have adequate performance so that all local stations could be heard at good volume.

In addition, the set should also be easy to disassemble for service and once disassembled, the electronics and mechanical aspects of the set should be easy to work on. Care was to be taken to ensure that inputs and outputs were well separated and that component values could be easily seen. After all, it is just as easy to put components in a circuit with the values showing as it is to have them facing the chassis!

It was also suggested that a mock-up be made before actually starting construction, to test various ideas and eliminate those that were unsuitable as far as the cabinet, chassis and elec-

tronics were concerned. Laying out the major components on a piece of paper is one way of making sure that everything fits and that certain areas of the radio aren't going to be unduly crowded. After all, who likes delving under several layers of parts to get at a suspected faulty component? I don't and I'm sure very few other people do either.

It was expected that the contest would provide quite a learning curve for our members in various areas. Some are good at electronics while others are good at chassis construction, cabinet work or producing an aesthetically pleasing set, or providing good service and operational data. None of us excel in all these areas, so it was expected that members would ask others for advice if necessary.

Finally, a year was allowed for members to get their entry up and running. Unfortunately, this didn't prove long enough for some of the contestants and a couple of sets weren't finished in time. However, now that the judging of the award is complete, these contestants are being encouraged to

finalise their work so that each set really proves to have been worth the effort.

Technical suggestions

A number of suggestions were made as to how to obtain the best performance from two valves and yet still adhere to the KISS principle (Keep It Simple Stupid). These suggestions ranged from a regenerative detector with two audio stages (eg, using a 6N8 and a 6GW8) to a full superhet consisting of a converter, a single reflexed IF stage and a triode output (eg, using a 6AN7 and a 6BL8 or 6AN8). A small triode will certainly give adequate output, as demonstrated by the Chinese set described in the July 1999 issue.

The circuits of typical receivers that could be used as the starting point for experimentation were subsequently published in the club's newsletter. Of course, the contestants were free to adapt these or to develop something completely different, as the mood took them.

As it turned out, some contestants did try something new while others felt more comfortable using the existing designs. Even so, no member slav-



Two of the sets entered in the contest were housed in beautifully-made “Empire State” style cabinets.

ishly copied any design – either electronically, mechanically or in cabinet style or construction material. The variations all proved quite interesting and this was reflected in the higher than normal attendance at the meeting when the sets were first displayed.

What the contestants made

From the accompanying photographs, it can be seen that eight very different sets were presented. For a start, the size variations are quite noticeable, the sets ranging from about the size of a brick to one that would be suitable only for a giant’s mantle piece. In the latter case, I can assure you that the set has a performance that equals its size.

The cabinets were all made exclusively or partly of wood. It is easier to dress up than metal or plastic and when polished looks a million dollars. As can be seen, there are some very nice polished sets ranging from 1940s style back to “Empire State” style.

Harvey, the owner of the large mantle set, ran into trouble with the finishing of his cabinet. Another club member explained what was necessary to get a good finish on pine and cabinet restoration and this will be

described in a later article.

Several other sets were painted (or were to be painted) to look like the typical 1950s kitchen mantle set. As for the little blue set, it had most of its cabinet made from a 2-litre ice-cream container! It may not have been intended to look the prettiest but Noel (the owner) decided that his set would use readily available bits and pieces.

Because valve-radio power transformers are no longer manufactured, Noel decided to use two modern transformers, a 2155 and a 2853, to obtain the voltages that were required for his radio. The 2853 was wired back-to-front across the 9V output of the 2155 to obtain a suitable HT voltage.

What types of sets were built?

Five out of the eight sets were simple superhets (commonly called “supergainers” in amateur radio circles). They used a converter (mostly a 6AN7) and a regenerative IF stage, followed by a stage of audio amplification. All were AC-powered, with one exception which could be powered either from 90V and 1.5V batteries or from an AC supply, as required.

This latter set was a simple superhet, using a 1A7GT and the marvel-

ous little 1D8GT. Unfortunately, this was one of the sets that wasn’t operational at the time of the judging.

The other three units are TRF sets, two of which are “Christmas Box” radios as described in “Radio & Hobbies” back around 1952. These Christmas Box radios consist of a 6N8 regenerative RF stage feeding another tuned section and a diode detector, which then reflexes back through the 6N8 to give additional audio gain. The 6N8 in turn drives a 6M5 audio stage which then drives the speaker (if reflex circuitry isn’t something that you fully understand take a look at the February 1996 issue of SILICON CHIP).

The third TRF set used a 6J7G regenerative detector and a 6V6GT audio amplifier.

Solving problems

Have you ever done anything worthwhile that didn’t give some problems before success was yours? Well, that’s the way it proved to be for the contestants who built these sets.

For example, Dennis who built the smaller more ornate Empire State cabinet ran into trouble with his bending and steaming. The result was a somewhat wavy rather than a smooth fin-

ish on the timber – and Dennis loves woodwork. He was disappointed with it but will no doubt sort the problem out.

Nearly everyone ran into trouble getting the regeneration going in their simple superhets. They found that they needed to wind many turns of wire onto the IF transformer to get the reaction to work properly. There was detuning of the IF transformer in most cases, too. I built a similar receiver around 20 years ago and had no trouble with this but I did use a different method of obtaining the reaction. Hopefully, we'll get to the bottom of this idiosyncrasy over the next few months.

Next month

That's all for this month on this very interesting project. In the next issue, we'll take a look at just how well each of these little sets works. One question that did arise during the course of the competition was which type of set performed the best – the TRFs or the simple superhets. At the moment the jury is still out on that one but there will be some answers for you next month.

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This photo shows the three winning sets. We'll look more closely at these sets and describe their main features in Pt.3 of this series.