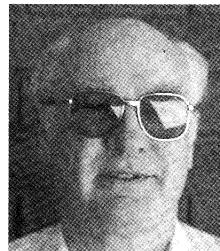


# VINTAGE RADIO

By RODNEY CHAMPNESS, VK3UG



## A farewell, an introduction & a "Little General" radio set

In this, my first column, we take a look at what vintage radio is all about and list some of the topics I intend to cover in the future. I also briefly describe a "Little General" valve radio that was built back in 1992 for a competition.

I am pleased to have the opportunity to contribute to vintage radio by way of this column. I am following in John Hill's footsteps who has informed, educated, entertained and brought vintage radio to the fore in many peoples minds throughout Australia and New Zealand over the last decade. Some readers have not agreed with his thoughts in particular areas but this has produced a positive result because it has made people consider what vintage radio is all about.

I will endeavour to continue to attract readers' interest in vintage radio in its many aspects, covering topics not previously mentioned as well as

some that have already been covered but from a different perspective. I know that John's contributions and mine will be complementary.

### What is vintage radio?

Now is a good time to reflect on what vintage radio is all about. It is to do with the collection, retention, restoration and display of our radio (and, dare I say it, television) heritage. Some people are interested in collecting and preserving magazines, service manuals, books and advertising material dealing with our radio history. Others collect 1920's sets or sets from whatever era they particularly fancy.

Many will just keep the sets as they are while others will fully restore them to their former glory. The collection of technically innovative sets or unusual sets will appeal to others, while some prefer to restore sets where their ability at fine woodworking can really come to the fore.

A small but growing group is interested in building replicas of a bygone era and learning about how the sets worked. Others will build a "bitsy" out of several sets to show others what a typical set of the particular type was like. To me, all of these activities are valid as long as people don't claim something to be what it isn't. For example, converting a battery set to AC, then claiming that this is how this particular "AC" set works is quite wrong in my book.

Many sets were converted from vibrator or battery operation when AC power came to country areas and I was one who converted several sets at the time. It was cheaper to convert to AC than throw them out and buy a new one. In general they were good sets and the heart transplant of AC valves made them even better performers, provided the conversion was done competently. This occurred before vintage radio collection and the retention of our radio heritage became of interest.

These converted sets in their own way fill a niche in our radio heritage. However, I don't believe that sets should be converted from battery or vibrator operation to AC if they are intact today. After all, they are a part of our radio heritage, are relatively rare and are definitely worthy of restoration in their own right.

It is not my intention to buy into

### Farewell from John Hill

For 10 years I have been writing Vintage Radio for SILICON CHIP magazine. However, after 120 editions I have exhausted my storehouse of ideas and have nothing left to write about.

Past material could be rehashed, but that has already been done in some instances. It is better for me to sign off and let someone else with some fresh material have a go and that someone is Rodney Champness. A change in direction should be good

for both the magazine and its readers.

I wish Rodney well in his new venture and hope he enjoys it as much as I did. I would also like to take this opportunity to thank Greg Swain, Leo Simpson and Philip Watson for their assistance over the past 10 years.

John Hill.





The author's "Little General" is quite compact for a radio receiver that's based on valves.

arguments about what an individual should or should not do with his or her sets. However, I believe our endeavour should be to retain as accurate a record of our radio/wireless heritage as possible.

People who are genuinely interested in vintage radio come from many walks of life. Some like myself have been professionally involved in radio all their adult lives, while others have only recently had the spark of interest kindled in vintage radio. Particular interests in vintage radio can be quite varied and I will endeavour to cover as many topics as I believe I can competently handle.

Any constructive criticism is welcome as are suggestions on topics to cover. Comments from across the Tasman would be also most welcome, as I would like this column to continue to be relevant to New Zealand readers.

## What will be covered?

I expect to present articles on sets of specific interest, history, test instruments, servicing/restoration, safety, design, transistor sets (yes, some are vintage sets now), vintage TV sets and other subjects as they come to mind or as readers suggest them.

I have had an interest in the transmitting side of radio as well as receiving, so there will also be material on this topic from time to time. This aspect of vintage radio is important be-

cause without transmitters there would be no need for receivers!

## A "Little General"

The "Little General" was a radio designed by "Radio & Hobbies" magazine at the beginning of World War II. It was so successful that upgraded versions were presented up until the early 1960s.

As a concept, it was intended as an austerity set running off AC mains, with a converter, one IF stage, one audio stage (the last versions had 2-stage audio amplifiers) and a rectifier. It was not expected to be high fidelity or to be highly sensitive and was limited to one watt of audio. Instead, it was intended to be a good little second set for the workshop, garage or the kitchen that was easy to build and get going, at minimal cost.

The beauty of the design was that it could be built by obtaining the bits and pieces as required or by using substitute parts. It was also possible, at the time, to buy a complete kit and meticulously copy the layout and wiring diagrams shown in the magazine. Thousands of these sets were built from the various models described.

In 1991/92, the Vintage Radio Club of North East Victoria ran a competition to build a "Little General". I, along with about 12 others, joined in the fun, with some building near exact copies of particular models while others let their flair for design run riot.

Some built sets with beautiful cabinets in the old cathedral style, while I decided to build the smallest one I could with really good performance. The accompanying circuit and photographs show what the set is like.

I took this as quite a challenge, and commenced looking up all the old circuits I could find that fitted the criteria of a "Little General". I remembered that a portable valve TV set I commonly worked on used a sharp cutoff video IF valve (6EW6) in the audio output. Why not, I thought; just because it is designed for RF doesn't mean it won't work well at audio frequencies. It wouldn't give as much output as a 6V6 but then I didn't want megawatts of sound anyway.

I went through the valve data book and narrowed the list of suitable valves down to just a few, then checked how much space there was in the proposed cabinet. Finally, a 6EJ7, a very high gain video IF valve, was selected. A 6BX6 would have worked nearly as well but was taller and wouldn't fit into the cabinet. Another advantage here was that the heater current was only 0.3 amps.

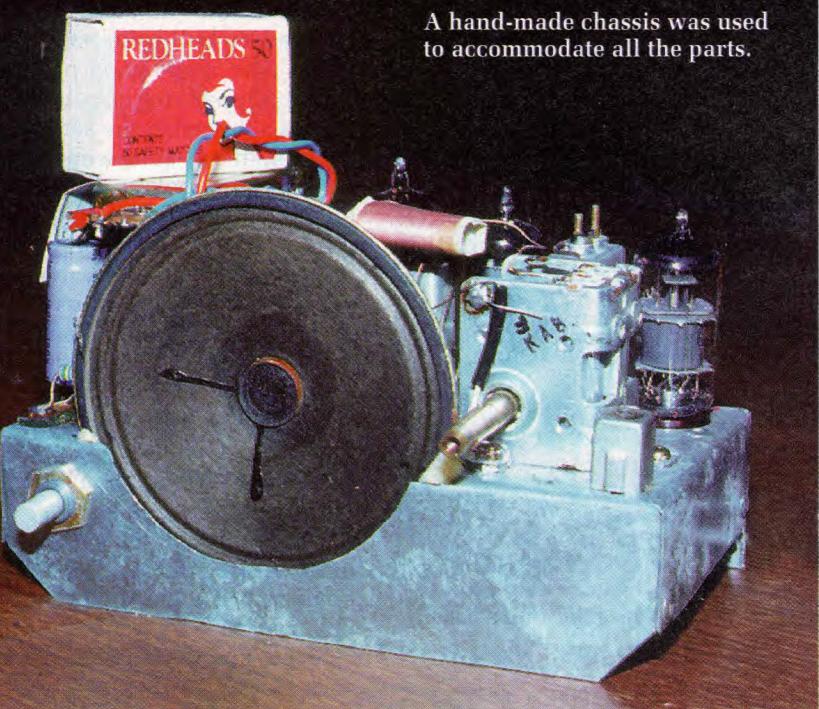
Next was a suitable IF valve. As AGC/AVC was to be supplied to this valve, one with variable cutoff was needed. A 6BA6 would have been quite suitable but I wanted to keep the heater current down. A very suitable valve, a 6BJ6, came to mind with its heater current of only 0.15 amps and so this was selected.

I couldn't find any converter valve in the common series that had a 0.15A heater, so after looking at all the available types, I decided that the 6AE8 was as good as any. Physically, it wasn't too high either. Therefore, the total heater drain was 0.75 amps and with a miniature dial lamp would total 0.8 amps – the heater current of a 6BV7 by itself!

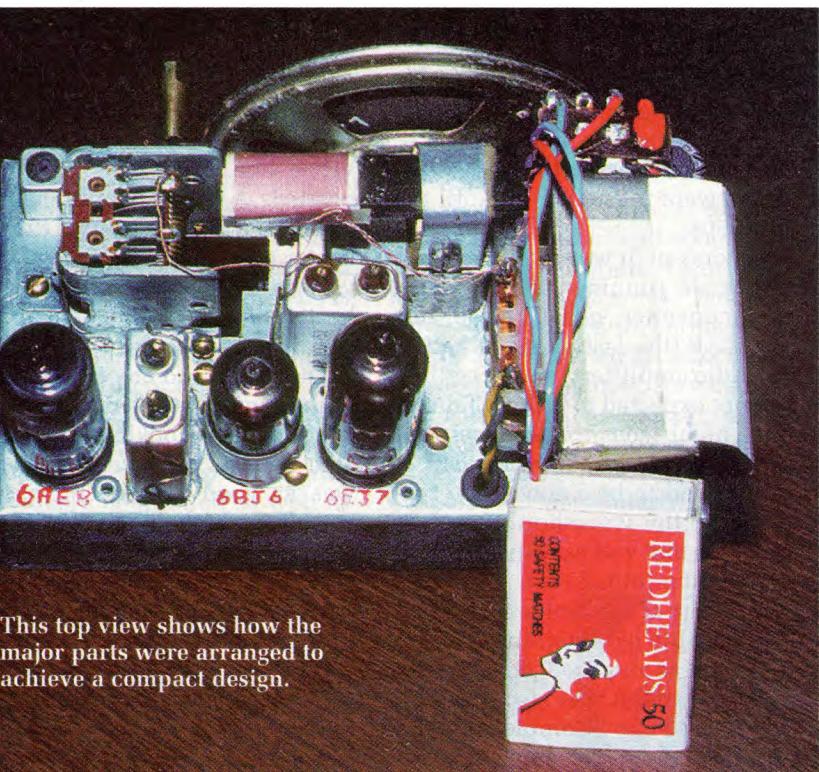
As none of these valves has in-built detector diodes, a decision was made to use silicon detector diodes – one acting to produce delayed AGC and the other working as the detector.

## Power transformer

Power transformers can be a real problem and getting one that would supply the required voltages and current was a tad awkward. I was fortunate that one of the members of the club offered to rewind a 2155 transformer for me, for which I was grate-



A hand-made chassis was used to accommodate all the parts.



This top view shows how the major parts were arranged to achieve a compact design.

ful. The 6.3V winding was left intact and the new HT winding (wound with 37 B&S enamelled wire) gave about 115V AC which, when rectified by a bridge rectifier, gave 135V DC on load. This was a little less than was hoped for but adequate just the same.

I was fortunate in having a couple

of the miniature Philips IF transformers, a miniature MSP paddeless dual-gang tuning capacitor, a 3.5-inch loudspeaker, a ferrite rod and coil (sold as replacements for transistor sets) and the oscillator coil from a transistor radio.

It was doubtful how the transistor

oscillator coil would go. I wasn't prepared to apply the HT to the feedback winding in case the insulation wasn't up to it, so I shunt fed the feedback winding from pin 9 of the 6AE8. It worked like a dream.

Having got all the bulky parts sorted out, it was time to play musical chairs with the components to see where everything would fit. This was done keeping in mind that outputs need to be kept away from inputs, controls need to be in the "right" place, and that there must be sufficient ventilation for all the heat-producing parts of the set. It was a challenge and took quite some time but the end result was very satisfying.

After much work, the set was assembled and shoehorned into quite a small case, as can be seen when compared to a box of matches. There was quite a bit of fine tuning of the circuitry to get the best out of the set. I was fortunate enough to be able to use an AVO mutual conductance valve tester to set the operating conditions of the valves to optimum.

There are a few items I found which may be of assistance to other constructors. It is desirable to put an earthed shield across the IF valve socket to shield the input from the output, particularly when using a high-gain valve. The set was a bit unstable until that was done.

The filtering of the IF signal out of the audio section is not well done in most sets and a small mica or ceramic capacitor from the grid of the audio output valve to earth (pin 2 to earth in this case) overcomes this problem. Most sets put the capacitor on the other side of the grid stopper resistor, where it is ineffective.

It is most desirable to keep iron-cored transformers mounted so that their cores are not in line with one another, otherwise hum can be induced from the power transformer into the audio transformer. I tried various tricks with the speaker transformer, but was unable to completely rid the set of hum due to this induction.

The final set is shown in the photographs and it really is quite compact. The set will detect 5 microvolt signals over its 525-1650kHz tuning range, has 0.4 watts of audio output, uses 0.8A at 6.3V and 25mV at 135V, and draws about 13 watts from the mains. It didn't win the competition but it did get second place.

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