VINTAGE RADIO

by Roger Johnson

Some unusual Healing practices

No, this month's story has nothing to do with the Australian Medical Association, or alternative health care! We're talking about A.G. Healing and its receiver models of the early 1930s, which used some quite unorthodox ideas. The company was also one of the few major manufacturers to venture into direct coupling.

THE AUSTRALIAN FIRM of A.G. Healing, according to their 1932 Radio Guide, was established in 1897. They described themselves as "the largest, most friendly and most capable wholesalers serving the Radio, Automotive, Bicycle and Plating Trades. The opening of the Radio Sales and Service department last season marked another step in the progress of this Company."

The firm was the distributing agent for Osram valves, and sold a host of household electrical items as well as a vast range of radio parts and equipment, including practically every known brand and type of valve available!

The *Guide* showed photos of their factories in Goulburn Street, Sydney; Franklin Street, Melbourne; and Pirie Street, Adelaide. The service literature that is available suggests that the first models which were released were designated 1932 models.

Fig.1: One of the very first model Healing sets, the table model H3D 2V. This example has not been restored.

Models for 1932

One of the very first Healing sets is shown in Fig.1, a model H3D 2V. As you can see, it is a timber box table cabinet with a separate electromagnetic Jensen speaker in its own cabinet.

Here we have one of the first departures from what was then standard practice: the speaker plug is NOT the standard 'UX' four-pin plug. There *are* two thick pins and two thin pins, in a nominally UX layout, but the two pairs of pins are diagonally opposite one another.

The circuit, shown in Fig.2, is a two-stage TRF without reaction, direct-coupled to a type 245 triode output. Direct coupling has been covered before in this column, particularly by my predecessor Peter Lankshear in his August 1991 article on the 'Loftin White' amplifiers.

However there were some minor differences between the Loftin- White circuits and direct coupling in domestic receivers. A study of the circuit will show that the full filtered rectified output voltage, about 420 volts, is applied to the anode of the 245. This seemingly far exceeds the maximum rating for a type 245, and this would be the case if the anode voltage was measured with respect to earth; but of course valve potentials should be measured with respect to cathode.

In this case the centre-tapped filament of the 245 represents the cathode, to which is connected the speaker field and R4, 5 and 6. Together these total over 7000 ohms, so that with entire cathode (in this case, anode) current flowing through them there is a voltage drop of some 200V from cathode to earth. As a result, the anode-cathode voltage for the 245 is actually only 220V or so — much more respectable.

Shunted across both the 245 and its anode load (the speaker transformer primary winding) is R8 and R9. These in effect form a voltage divider to derive the anode supply voltage for the 224A detector stage. Resistor R7 forms the anode load for the detector, and also the grid leak of the output stage because of the direct coupling. The values of R8, R9 and R7 would be adjusted to make the grid voltage of the 245 about 140V positive to earth, or 60V less than the cathode — giving a bias of about -60V, about the right figure.

Volume control is by variation of the screen voltage of the RF stage, another type 224A, using pot R2 which is also connected from the output stage cathode to ground.

Detection is by the 'anode bend' method, and there is provision for a gramophone pickup. This is connected between grid and a slight positive potential — presumably to ensure that the valve operates in more of a 'class-A' mode. As has been mentioned before, some manufacturers simply connected the pickup between grid and earth in valves operating as an anode bend detector; a very poor design practice.

Pot R5 is a preset chassis control, and not a panel control, and is used to minimise hum. Apart from tuning and volume the only other panel control is the antenna coupling switch.

As you can deduce from the photo, this set has not been restored to operating condition (despite it being on the shelf for at least 15 years!). However a very similar circuit with an almost identical front end, but using conventional R-C coupling to a type 247 output valve

has been restored. Performance is not particularly good. Very careful adjustment of antenna length, antenna coupling and alignment is required to eliminate adjacent station interference. It is almost a fundamental requirement that alignment is done *in situ* — alignment in a repairer's workshop is no guarantee of success if it is moved to another location.

Two-valve models

The Healing model 20 is a 2/3-valve set using the rarer Mullard S4VA direct coupled to the Osram PX4, and the reliable 280 rectifier. However this circuit at least uses regeneration.

The model 201 is also a direct-coupled combination of a 224A and 247, but here regeneration is used and adjusted by varying the screen voltage. The potentiometer is shunted across the reaction winding, so that as well as reducing the voltage it 'dampens' the winding.

Healing's model 22 and 23 are conventional 2/3-valve regenerative detector designs. The former uses a 47/247 combination and the latter a 57/59 pair. The volume control in these two circuits is a 10k pot in the earthy end of the aerial coil primary. It is actually designated 'selectivity' (the very nerve — as if there is a choice!) and has the unfortunate habit of slightly de-tuning the station when the setting is altered.

Healing produced conventional 2/3-valve TRFs in 1934 (model 24) and 1935 (model 25E) using 6C6/42 combination. In fact along with 'Eclipse', they were the last factories to produce radios of this type.

Healing anomalies

As the old saying goes, all that glistens is not gold. Despite a given model being described in the service literature, minor variations did occur that were not always recorded. One such example is the Healing model 33, of which two very original examples have been seen.

Now the service diagram shows the line-up as 58/57/59, with an RF stage and a regenerative detector with grid leak detection. But of the two examples that were seen, one had a 58/57/59 lineup using anode-bend detection, and the other used a 58/57/47 combination using grid leak detection...

There was no doubt that each chassis was a model 33. The little name plates which are bolted to the chassis clearly showed the model and serial number, which was also stamped into the underside of the chassis for good measure.

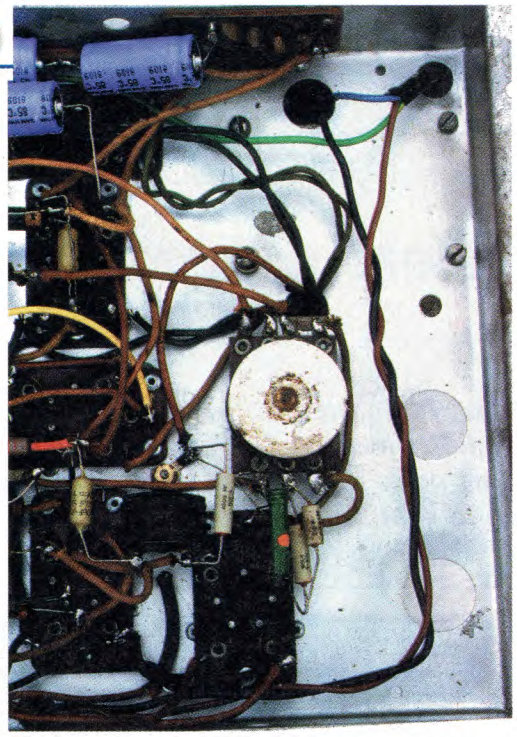

Fig.4: The oscillator coil of the model 60. The metal disc is the unusual padder.

Four-gang tuning

In the years 1932 to 1934, as far as can be determined, Healing produced 17 TRF models and 28 superhets, of varying size and complexity for both battery and electric operation. In the 1932/33 period, six models were produced that had an enormous four-gang tuning capacitor, identical to the very first AWA four-stage TRF model of 1932 and which also appears identical to the Atwater Kents of similar vintage. The circuit for one of these jobs, a model 60, is shown in Fig.3.

The models 40 and 41 were three stage TRFs with pre-select or bandpass tuning in the first stage. The model 40 was doing its best to overload a direct-coupled type 245 output!

The model 50 used a tuned RF stages, and plugged straight into the DC mains without any isolation whatsoever. The valve types were the very first series 6.3V indirectly heated types 239 and 236, and a conventional C443 output. The filaments were wired in series and supplied from an enormous wire-wound voltage dropping resistor, which looks as though it could be placed at the front of the cabinet and doubled up as an electric radiator!

Th electric models 60 and 61 were superhets with a tuned RF stage and bandpass tuning, and incorporated a speaker field of 7500 ohms which was placed directly from HT+ to earth.

Finally, the battery model 65 was also a TRF with an RF stage and bandpass tuning, anode-bend detection and with class B push-pull output. This set is particularly curious in that the two RF stages and the detector all used types 232. The output valves were type 30s, but the driver was an A415, which by 1932 would just about be obsolete.

The 'A' supply was 4.0 volts, and each of the other five 2V valves had a 33-ohm resistor in series with the filament. One wonders why they bothered. Surely it would have been just as simple to incorporate a type 30 as a driver, like a host of other manufacturers — including Healing themselves?

Unusual practices

We now come to some other quirks of Healing manufacture. Firstly, in the 1932/33 period they used a very shallow chassis. There were two sizes (large and small), and all of their models with the

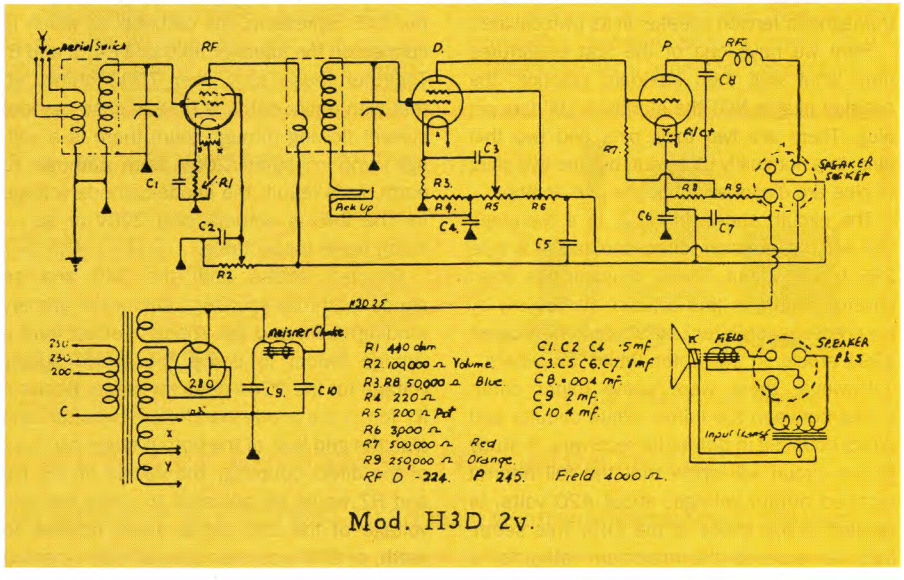

Fig.2: The circuit of the H3D 2V table model, with its direct-coupled output stage.

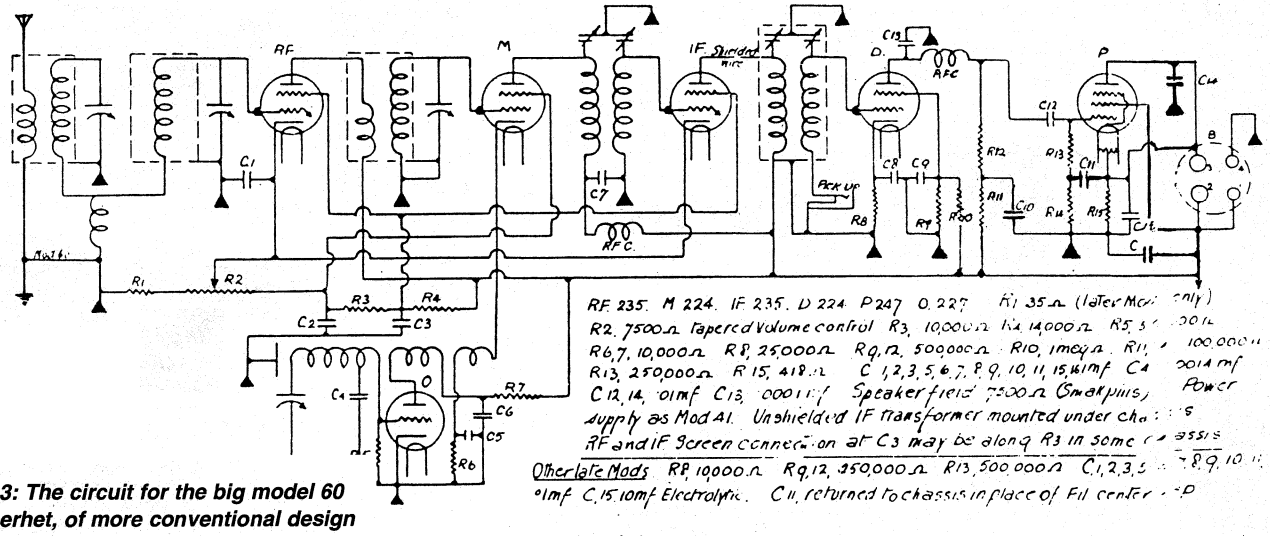

Fig.3: The circuit for the big model 60 superhet, of more conventional design but still unorthodox in some areas.

Model 60

exception of the two table models were built onto one or the other. Unused valve socket and/or IF transformer holes were simply left vacant.

In the big battery superhet model 73B, there are no holes in the IF cans to allow access to the trimmers. One might suppose that the trimmers are mounted at the base of the coils, and access is via holes in the chassis. WRONG! It is necessary to remove the can and adjust the trimmers whilst the coils are unshielded. One can imagine all sorts of instability, which does not seem to occur, at least if they are aligned one at a time. It was thought that if a jam tin with both ends removed was placed over the IF and earthed with a wire and a pair of crocodile clips, then that would contribute to stability. However, this proved totally unnecessary.

A point about the IFT's of the model 60 in particular is that the adjusting trimmers are connected between plate and earth, and not plate and HT. There is of course no particular reason to query this practice; it's just that it is a little unorthodox.

Notice the 'front end' of the model 60 circuit. We see that the oscillator coil has a line drawn to the left of the coil, which is earthed. This represents the padder, and was used on several of their models (60, 73, 53 and 55). The oscillator coil is far from conventional. It is a disc shaped coil (both windings) with a bolt passing through the centre of the 'former'. To the free end of the bolt is attached, via a pair of locking and adjusting nuts, a disc approx 2" in diameter. The spacing of this disc from the coil represents the padder adjustment.

Note the bandpass coupling coil in the antenna circuit. It is a small coil on a shallow 1" diameter former with a few turns of wire, exposed under the chassis and connected to the shielded coils just as shown.

Another foible of the model 60 is that the IF valve is in the front corner of the chassis, and the grid lead of considerable length, unshielded, travels along the top of the chassis and enters through the chassis to a most unusual IF transformer. A picture tells a thousand words,

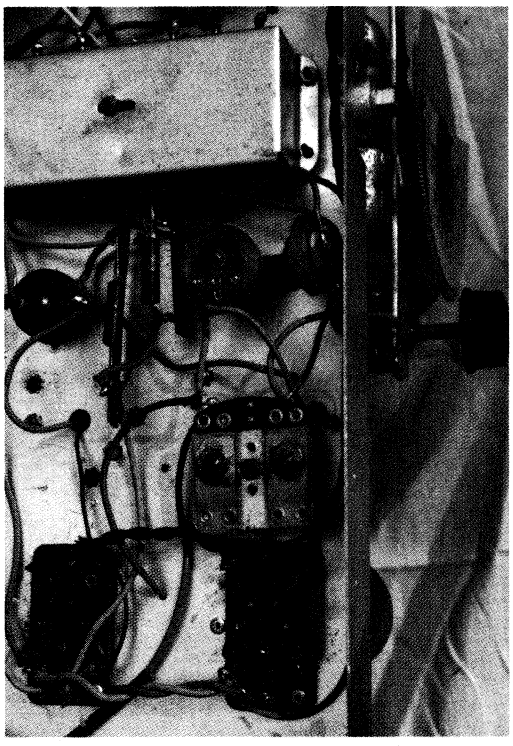

Fig.5: A somwhat unorthodox under-chassis IF transformer in the model 60, with its alignment trimmers.

and this IFT together with the associated earthy trimmers, are shown in Fig.5. Despite this, instability has not been a problem.

Unfortunately there is insufficient space to show all the photos and circuits.

Other superhets

Mention has been made of the large model 60 electric set and the model 73B battery set, but a couple of others deserve mention. The large model 73 has a preselector front end, separate oscillator, IFT's as described above and a new 2B7 detector/audio driving a pair of parallel type 59's. The model 73-1 also has a preselector front end, but with a more conventional oscillator, a tuning meter and a type 55 detector R-C coupled to a type 56 driver, which is transformer coupled to a pair of 245s in class-B. This model is equipped with two speakers, with commoned voice coil connections, but with their fields connected in series.

Although the *Radio & Hobbies* 'Little General' was claimed to be the first 3/4-valve electric superhet (which is debatable), the output valve of that particular circuit was driven direct from the diode load. In the Healing model 34, the line-up is a 2A7 mixer and one IFT driving an anode-bend detector type 57, which in turn drives a 2A5. There is no AGC, and the circuit probably worked quite well.

In closing, the early Healings had other quirks, such as output circuits using both parallel and push-pull configurations using types 59 and 45, in their big sets. But generally speaking they were well made, with heavy gauge plated steel chassis and good quality Jensen speakers. ❖