VINTAGE RADIO

By JOHN HILL

The 4-valve Howard receiver

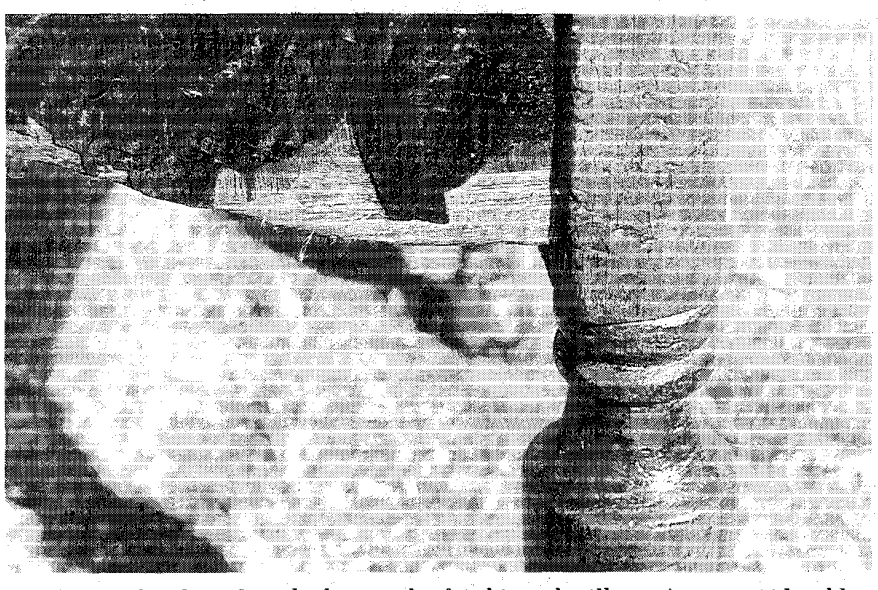
Last month, I mentioned that I had bought an old Howard, a mains powered 4-valve reaction set from the early 1930s. The Howard is a medium-sized console model of relatively square proportions which stands on turned legs. It was the latter feature that prompted me to buy this particular receiver.

Console receiver cabinets with turned legs are comparatively rare. Turned legs were in for only a short period and were popular around 1930, give or take two or three years.

Unfortunately, cabinets mounted on turned legs, particularly long turned legs, are relatively weak and the legs do not give rigid support. Shifting the set incorrectly can damage or loosen the legs and the cabinet can become quite rickety as a result. It was perhaps because of these problems, as well as the additional cost of turned legs, that cabinet makers turned away from this style to the legless console models of the mid-1930s onwards.

However, regardless of their shortcomings, console radio cabinets with turned legs have particular appeal and some are quite elegant to say the least. Whether weak, impractical or otherwise, turned legs look great and any receiver with this style of cabinet is a highly collectable item. It was the turned legs on the Howard that persuaded me to buy it and it is the first complete set I have been able to obtain with this style of cabinet.

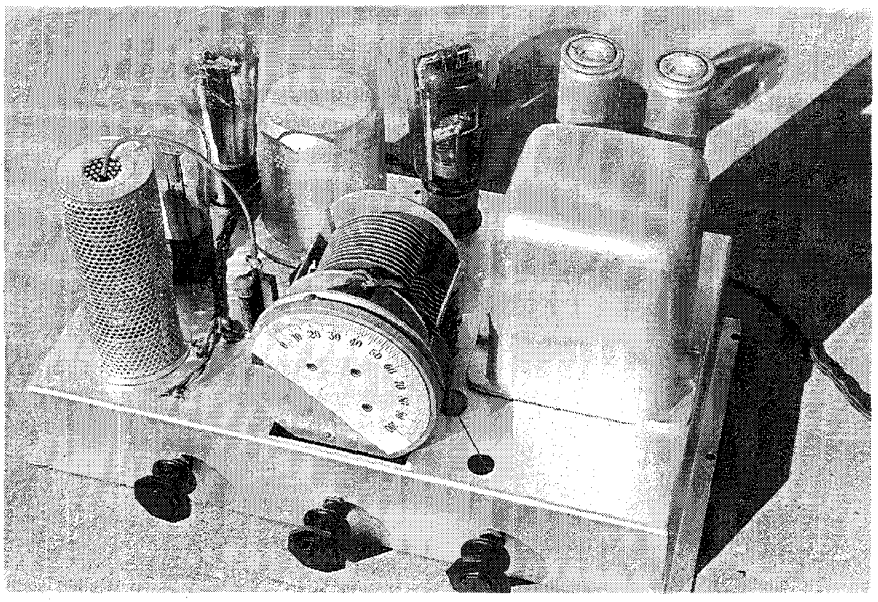
The Howard cabinet is fairly typical of the consoles made around 1930, although the turned legs are quite rare. These legs and the fretwork speaker grill give the radio a certain amount of charm.



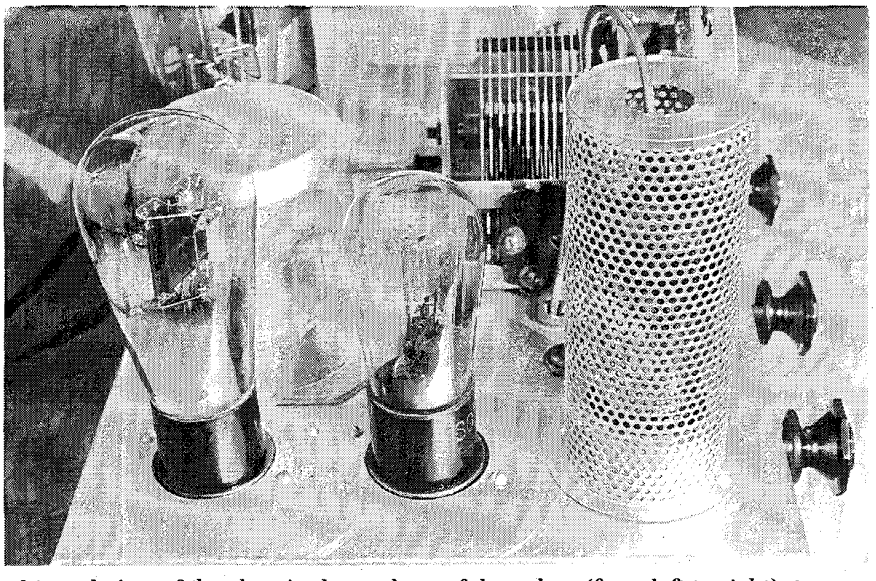
The cabinet has been knocked around a fair bit and will require a considerable effort to restore. Fortunately, the damage is all repairable.

Unfortunately the Howard's cabinet was only in fair condition. It has received many knocks over the years and some of the veneer has chipped away at the edges. Someone has also attempted a half-hearted refurbishing job which was far from professional. Nevertheless, the cabinet is restorable although it will require more than the normal amount of work.

The circuit is of simple design, even for a regenerative receiver, and consists of a detector followed by two audio stages. The first one is resistance/capacitor coupled, while the



The chassis cleaned up surprisingly well for an old-timer. Note the cast aluminium shields over the power and audio transformers. A shield was also fitted over the detector valve, although the set works just as well without it.



This end view of the chassis shows three of the valves (from left to right): 245 output, 227 first audio & 224 detector (in shield). The fourth valve in the set is the 1651 rectifier (behind the audio transformer at top left).

other is transformer coupled. The output valve (a 245 triode) drives an 8-inch electrodynamic loudspeaker. Not all of the valve sockets had the right valves in them but more about that later.

Reaction control

A 100pF variable capacitor is used as a reaction control and the audio from the detector is fed to the first audio valve via a 0.5MΩ potentiometer. This volume pot, when used in conjunction with the reaction capacitor, gives good volume control regardless as to whether the set is tuned to strong or weak signals. There are also three aerial tappings, so the effect of local station swamping can be minimised by selecting the appropriate aerial tap and reaction/volume control settings.

Component shielding on the Howard is elaborate - even where it is probably not required. The power transformer is encased in a cast aluminium cover, as is the audio transformer. The detector valve has a more conventional shield but the set works just as well without it.

Although the receiver was in working order, there were a few major items that needed attention. The volume control was very noisy, the dial cord was slipping, the detector and rectifier valves were not the original types, and there was the usual dust, rust and lack-lustre appearance of the chassis in general. There were numerous other incidentals that also needed looking into. The repairs all seemed to be straightforward enough but little did I know what was in store.

Broken dial drum

First, the diecast dial drum had a buckle in it. However, it could not be removed unless the tuning capacitor was also removed. This was essential anyway because the capacitor was a plain bearing type and it needed attention in the bearing department.

With the dial drum free from the capacitor, the reason for the buckle was fairly obvious: the centre had broken out at some time and had been cemented back into place with epoxy. The joint was broken again, reglued with superglue and reinforced with a steel plate. This repair was much stronger than before but the drum still ran with a wobble because the hole in the centre had never been drilled straight in the first place.

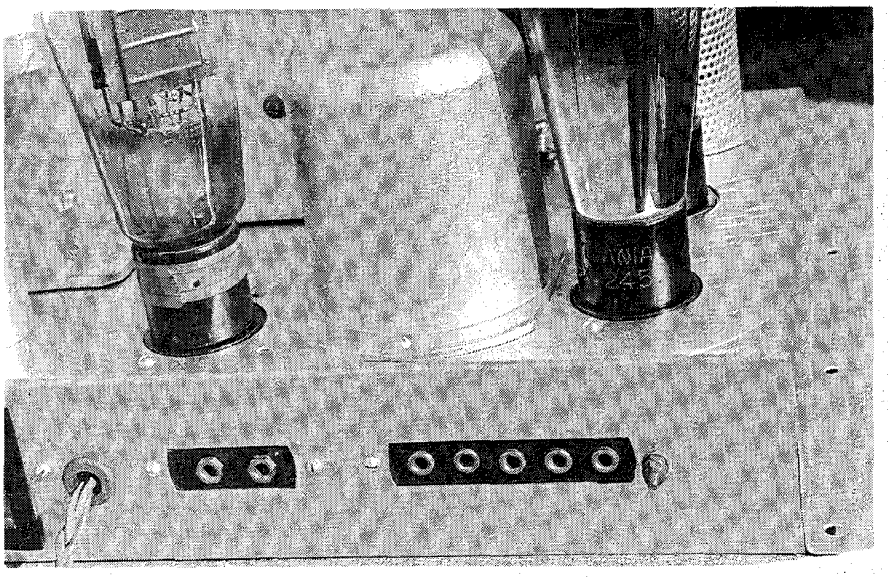
Not to be beaten, I decided to set the drum up in my lathe, re-bush the centre and drill it out again so that the new hole was both concentric and square to the face of the drum.

The chuck jaws had hardly touched the dial drum when it fell into the tray of the machine in four pieces. They don't call old diecast aluminium "muck metal" for nothing.

Modern epoxy resins are very useful adhesives and the four pieces were all glued back together again - and the damn thing still runs with a wobble!

The tuning capacitor was much easier to fix. The loose front bearing was adjustable and a good fit on the shaft was obtained in no time at all. A piece of thin cardboard was also used to pack the front bearing so that the plates were more centrally positioned, the cardboard allowing for the wear in the thrust bearing.

By the way, tuning capacitors are much easier to clean and work on when they are removed from the chassis. The chassis is also much easier to



The rear of the chassis carries sockets for the phono pickup (left) and for the aerial taps (right). There are only three aerial taps - the other two holes once accommodated an external aerial & the mains aerial plug.

clean and paint while the capacitor (and any other components) are removed. This was the case with the Howard and the chassis was rubbed down and painted while the capacitor was on the workbench.

Ring-in valves

Cleaning down the chassis revealed the original valve markings that were stencilled on when the receiver was made. The detector socket was supposed to have a 224 valve but an F242 had been fitted at some stage instead. This valve was so weak it tested at only 15%, compared with the 80% of the 224 that replaced it.

Although supposedly the wrong valve, the F242 looked exactly the same, both internally and externally, as the 224 valve and was no doubt a satisfactory substitute apart from the poor emission problem.

The 227 (first audio) and 245 (output) valves both tested OK, as did the 80GT rectifier.

Using a GT valve in an ancient regenerative set looks terrible - even if it does work OK. The originally specified 280 rectifier with its bulbous shaped glass envelope looks far more appropriate but, unfortunately, I did not have a spare one to use in the Howard.

However, in my "odd valves" box there were a couple of 1651 valves which are similar rectifiers in shape and performance to the old 280. The only real difference is that they are 4-volt valves whereas the 280 was a 5-volt type.

One of these 1651s was fitted to the rectifier socket with a low-value wirewound resistor (0.6Ω - 2 x 1.2Ω in parallel) to drop the 5-volt filament supply down to about four volts. The big old 1651 looks great and is a better substitute for the 280 than the 80GT. Incidentally, an 80 still works reasonably well despite the lower filament voltage.

Several other parts needed attention underneath the chassis and the first job was to replace the volume control potentiometer. The reaction capacitor was also cleaned up and a drop of oil on its spindle made it much smoother to turn.

Dangerous aerial

One particular capacitor also seemed to be in an odd place and after checking it out, I decided to remove it from the receiver altogether. It was the mains aerial capacitor.

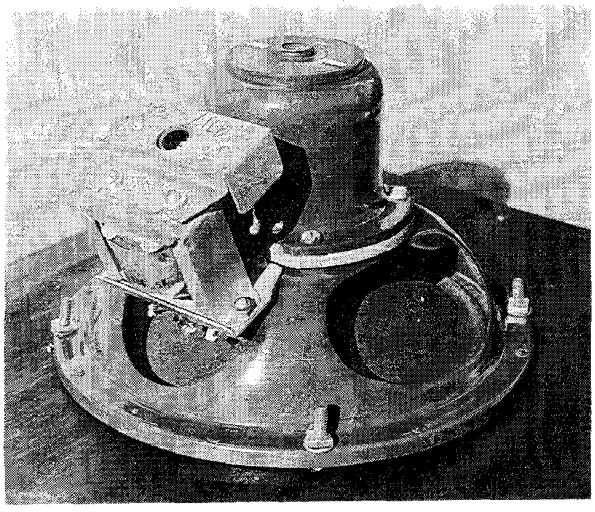
The purpose of a mains aerial is to use the power supply wiring as an aerial and there was a connection from the primary side of the power transformer to an aerial plug, with only an ancient capacitor in between to isolate the circuit from the mains. It's a dangerous arrangement and this is the second such aerial I have removed from an old receiver.

The set's original electrolytics had long been replaced and these too were now in need of replacement. Replacing electrolytics is a fairly standard procedure with radios as old as the Howard.

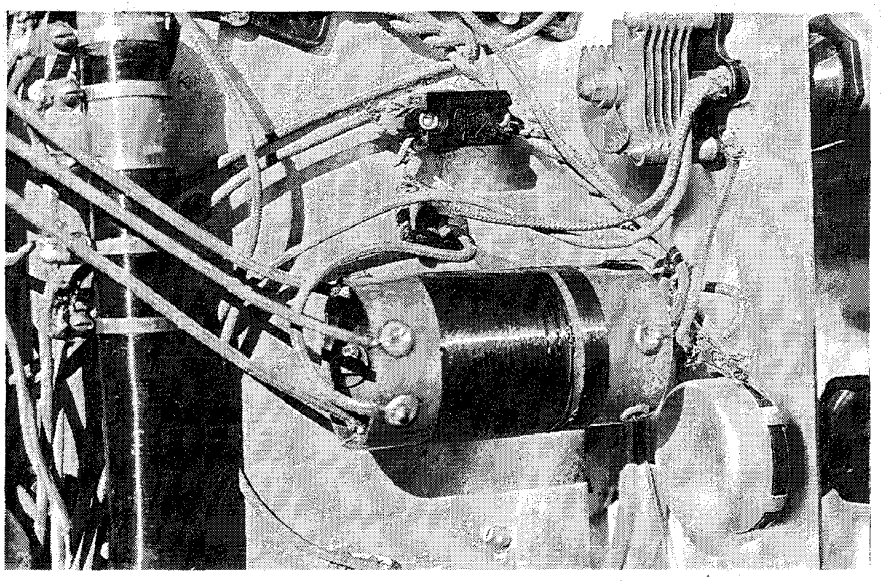
Checking out the only two carbon resistors in the receiver revealed that they had both gone high with age. The worst one was the 2MΩ grid leak resistor - it had risen to 6.5MΩ. Oddly enough, the replacement resistor seemed to make little or no difference to the set's performance.

There was still another resistor to check out and that was the high tension voltage divider. Past experience has shown that these wirewound voltage dividers can give a lot of trouble when the contact areas at the various taps no longer make a good connection. As far as I am concerned, it is standard procedure to remove each tap and thoroughly clean it and the resistor wire before reassembling it again.

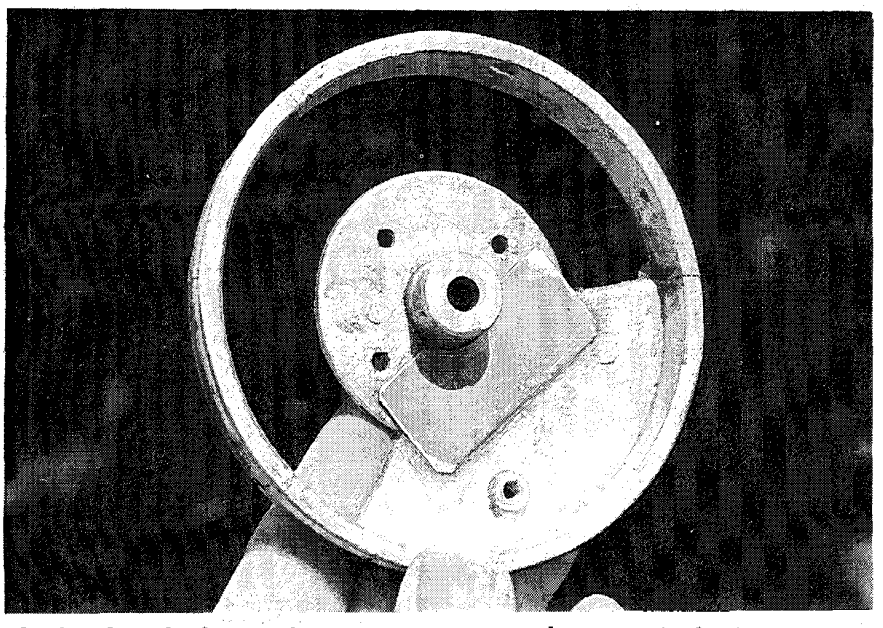
Cleaning the resistor taps prevents the poor performance and high tension crackles that can be caused by dirty, ill-fitting connections.



At one stage, the loudspeaker refused to work and the problem was traced to an open circuit speaker transformer. Once it was replaced, the problem was solved. The 8-inch electrodynamic loudspeaker works quite well for its age.



This underneath view shows the high tension voltage divider, coil, reaction capacitor and volume control.



The dial drum broke into three separate pieces and was repaired using Superglue. They don't call diecast aluminium "muck metal" for nothing.

Underneath the chassis, there are three initialled dates pencilled in (all within a week of each other), with the last one being the 21/3/32. It would appear as though these were put there by inspectors at the Howard factory when the set was made.

These dates are interesting because one would expect that only TRF and superhet receivers were being made in 1932. However, the cheaper regenerative sets were also still being made at the time. It must be remembered that 1932 was in the depression years and not many could afford a top of the range superhet receiver. Perhaps there was a greater demand for cheaper radios?

Crook loudspeaker?

The Howard's loudspeaker presented an unusual problem because it had decided to stop working some time between when it was removed from the cabinet and when it was connected to the restored chassis. A check with the multimeter soon revealed that the primary of the speaker transformer had become open and the transformer needed replacing. Once this simple repair was done the set burst into life and worked quite well.

One odd aspect of these simple regenerative receivers is that there is nothing in them to align. In a superhet receiver, the intermediate frequency (IF) transformers require alignment, as do the oscillator and aerial circuits. A simple reaction set requires no such adjustments - it just goes and that's that! There is nothing to tune but the stations.

At this stage of the story, the Howard is as good as it has ever been and is working very well considering its age and antiquated regenerative circuit. However, the chassis and speaker will have to remain on the bench for a while until I find time to restore the cabinet, which will be quite a big job.

When that task has been completed, the set will join the rest of my collection and will have the distinction of being the only one of my consoles with turned legs and a regenerative circuit.

A good vintage radio collection needs a wide variety of receivers to make it interesting and the Howard certainly is an interesting old set. **SC**