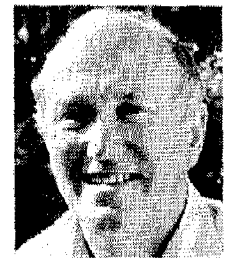
VINTAGE RADIO

By JOHN HILL



Restoring a Tasma TRF receiver

I had an interesting & most demanding repair to do recently, involving a 1931 model 65 Tasma console. The old Tasma is a very basic 5-valve TRF (tuned radio frequency) receiver & it was in a woeful state of disrepair.

The Tasma belongs to a radio collector mate who bought it sight unseen, except for a photograph which was sent to him from Queensland. What the photograph didn't show was that the receiver had no valves or loudspeaker and had a totally burnt-out power transformer.

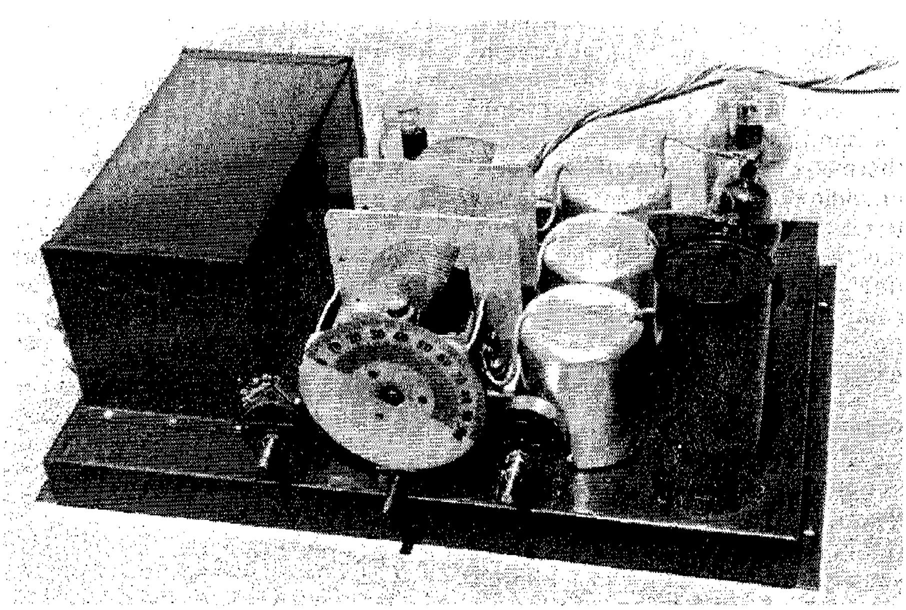
On delivery of the Tasma, its new owner was so disheartened with his purchase that he placed it in an auction. However, after a conversation with me about replacement transformers and other parts, the dilapidated Tasma wreck was quickly retrieved from the auction rooms. In due course, the chassis and two electrodynamic loudspeakers (a Jensen and a Rola) found their way onto my workbench. A Jensen speaker was originally fitted to the Tasma and that make was to be given preference as a replacement over the Rola.

Oh, how I wish that I had kept my big mouth shut! On seeing the Tasma for the first time, I soon realized why it had been sent off to the auction rooms. It looked as though it had spent most of its life in a tropical rainforest. I am inclined to think that Queensland weather is not kind to vintage electronics.

The burnt-out power transformer was interesting in that it was constructed more like a modern transformer rather than one from the 1930s. As shown in one of the accompanying photographs, each winding is placed side by side instead of one on top of the other, as was usually the case in that era.

Rewinding the transformer was considered at one stage but it was more than I could handle, as both the primary and high tension windings were open. And having it rewound professionally would be quite an expensive repair job – probably at least $100.

As luck would have it, the owner had a discarded old Hypressco chassis which would hopefully supply a suitable power transformer with a 2.5V low tension winding. That too was on my workbench, waiting to be cannibalised for spare parts.

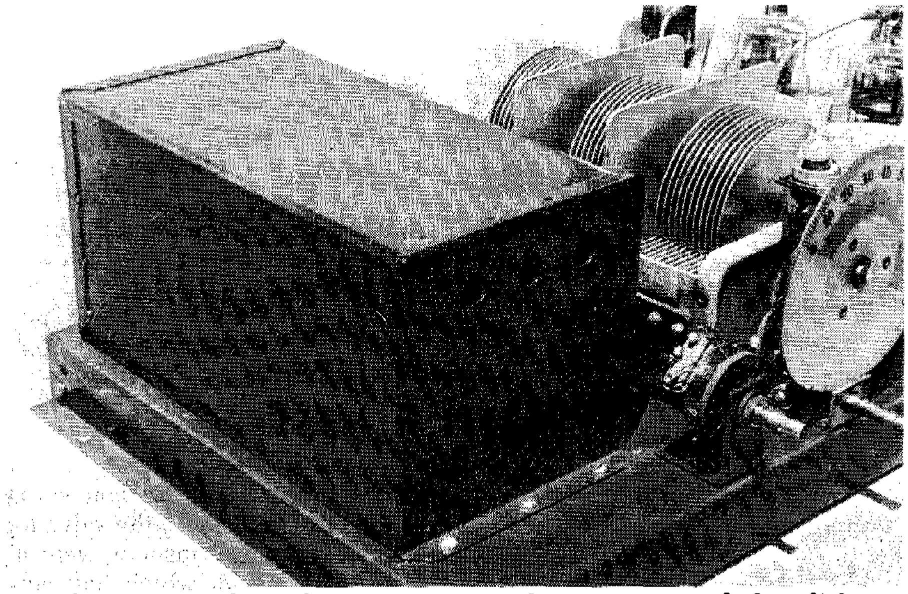


After a complete strip-down & repaint, the derelict Tasma chassis looked as good as new. This particular receiver now works better than ever, following the discovery of a manufacturing fault.

Other problems

A quick check over the Tasma chassis revealed that there were other serious problems apart from the defunct power transformer. Two of the RF (radio frequency) coils had open primary windings and they would either need repairing or replacing. When you are faced with a rotten job – it's usually rotten all the way!

The 3-gang tuning capacitor had its problems too, with dry rusty bearings and the three sets of moveable plates about 45 degrees out of alignment with each other. In addition, all the paper capacitors were leaky and the large block capacitors used in the high tension filter were particularly bad. Some of the resistors had gone high too and the wirewound high-tension dropping resistor had several dead taps on it, indicating either poor connections or



This close-up view shows the new power transformer cover. Made from light gauge sheet steel with spot welded seams, it is identical to the original apart from being 10mm higher.

a break in the resistance wire. Finally, the tone switch had also been badly strained and wasn't making contact at any of its four positions.

As I said before, rotten all the way!

Sorting the transformer

When faced with such a job, it is hard to know just where to start. I decided to check out the replacement power transformer to see if it would work in OK.

The Hypressco chassis had its share of problems too. The rectifier socket had a great hole burnt in it and all the valve pin connectors were just dangling on their respective wires underneath.

Although the power transformer was a large 2.5V type, it was not the original. There was another set of bolt holes in the chassis that suggested there had been a transplant at some time in the past. Checking out the transformer soon revealed that it had suffered a coronary in one half of the high-tension winding. Repair prospects at that stage of the proceedings did not look very promising.

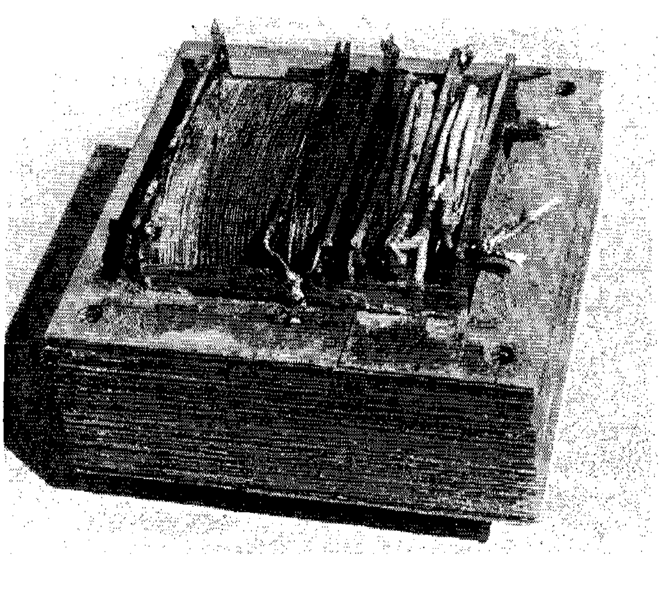
As the transformer was particularly large and robust looking, I thought I might try feeding the good half of the winding into a silicon diode bridge rectifier to supply the set's high tension. In fact, the bridge rectifier setup worked quite well except that it required a sizeable wirewound resistor to reduce the voltage to a level that would work in with a 2kΩ field coil. What's more, the owner wasn't really happy about his Tasma being "hot rodded" to such an extent, as he likes things to be reasonably original. The thought of silicon diodes and large 20W resistors did not appeal.

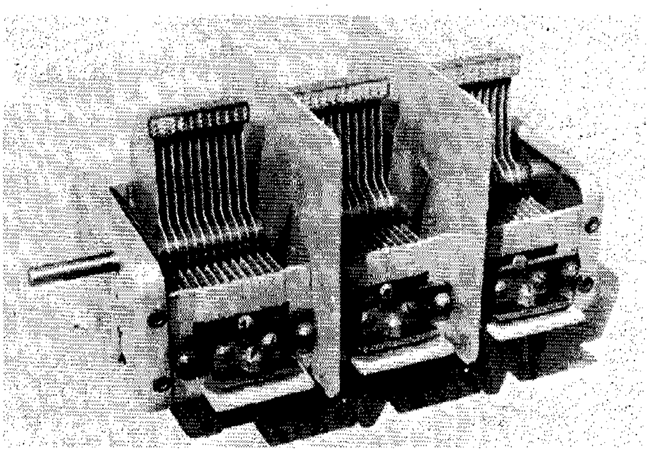
The next alternative was to use the half high-tension winding with the 80 rectifier connected as a half-wave unit. Surprisingly, this worked better than expected. It produced the correct voltage and is completely hum free while still using only 10μF electrolytics either side of the field coil.

As the set wasn't working at this stage, all the power transformer tests were done using a test rig that produced a 50mA load. Although the high tension arrangements are not a desirable set up, the receiver has run for prolonged periods of up to four hours without the transformer becoming any hotter than moderately warm.

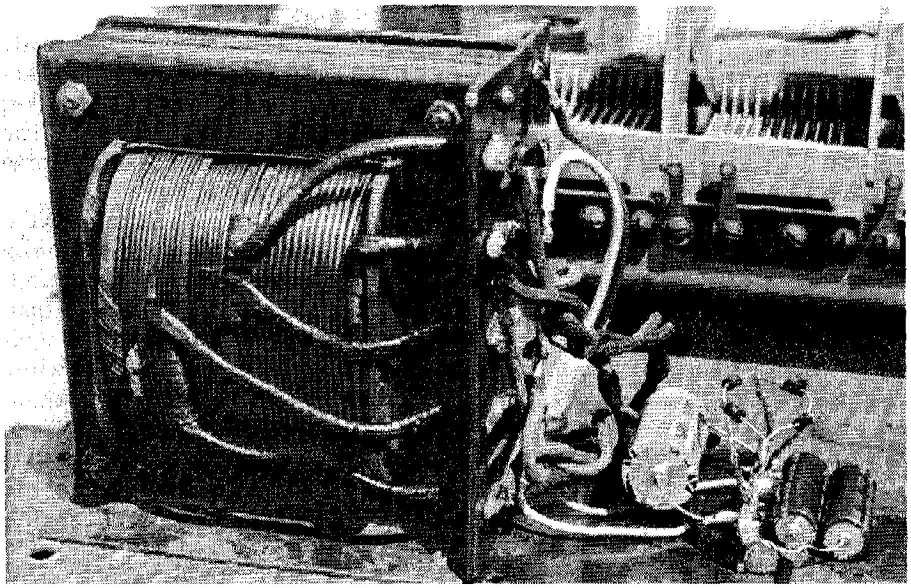
There was another problem yet to be solved regarding the replacement transformer. As the substitute unit is about 10mm higher than the original, the transformer cover would no longer fit. No problems! The local sheetmetal man made up a similar but deeper cover and after a coat of paint no one would ever know the difference.

Although some readers may strongly disapprove of all these devious goings on, everything seems to be working well in the power transformer department and once the cover is on it even looks OK. I believe it is better to improvise and have a receiver working than to have it original and either not working or costing a fortune to repair.





The Tasma's original power transformer (left) had many charred windings & was a total write off. Removing & stripping the tuning capacitor (above) was the best way to clean it & lubricate the spindle bearings.



Although the replacement power transformer only had one half of its high-tension winding intact, it was still able to supply the Tasma's needs. Note that this photograph was taken with the experimental bridge rectifier still in place.

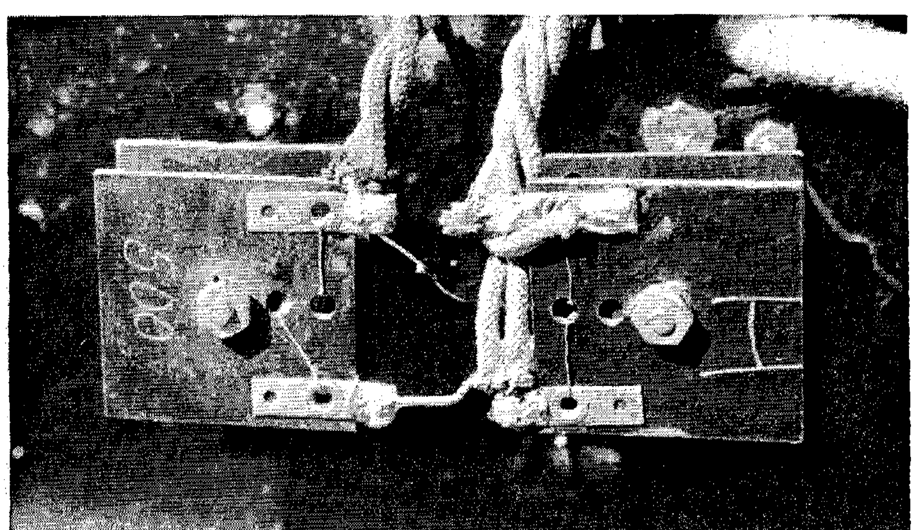
The two open-circuit RF coils were next. First, a rough sketch was made of the wiring connections so that everything would go back where it should. This is a good precaution to take before unsoldering anything – RF coils or otherwise.

The RF coils are identical and they had the same fault. Fortunately, the open primary winding is wound over the top of the secondary which made the repair a good deal easier than if it had been the other way around.

The problem was the much dreaded "green spot". The fine silk-covered wire had several spots of corrosion in it which could be clearly seen as it had come through the silk. The 60 turns of wire were counted before the damaged coil was removed.

Not having silk covered wire, I had to compromise. Enamel covered 0.125mm wire is about 0.01 millimetres larger than the wire originally used. It would have to do!

The inductance of the primary winding of an RF coil is by no means as critical as the secondary winding which is connected to the tuning capacitor. Variations in the secondary would cause tracking problems when tuning. A turn or two over or under on the primary would make very little difference.



These odd looking square components are wirewound resistors. One (right) is the centre-tapped filament resistor (for the directly heated output valve), while the other (left) is the 500Ω cathode bias resistor.

Disaster struck at about fifty turns when the wire broke. A strand of copper wire a mere eighth of a millimetre in diameter is not very strong and coil winding requires a reasonable amount of tension. When winding, one always hopes that the coil does not break or slip out of one's aching fingers. If either happens, it's a case of "oh well; start again"!

In the end, the outcome was quite successful although rewinding RF coils is always a tedious job.

Other repairs

There was a lot of wiring that needed to be replaced and the connecting leads from the coils to the valve top caps and tuning capacitor were all rewired. Resistors which had gone high were replaced and the paper capacitors all replaced with modern high-voltage polyester types. The ineffective tone switch mechanism was also repaired and a new wirewound volume control fitted.

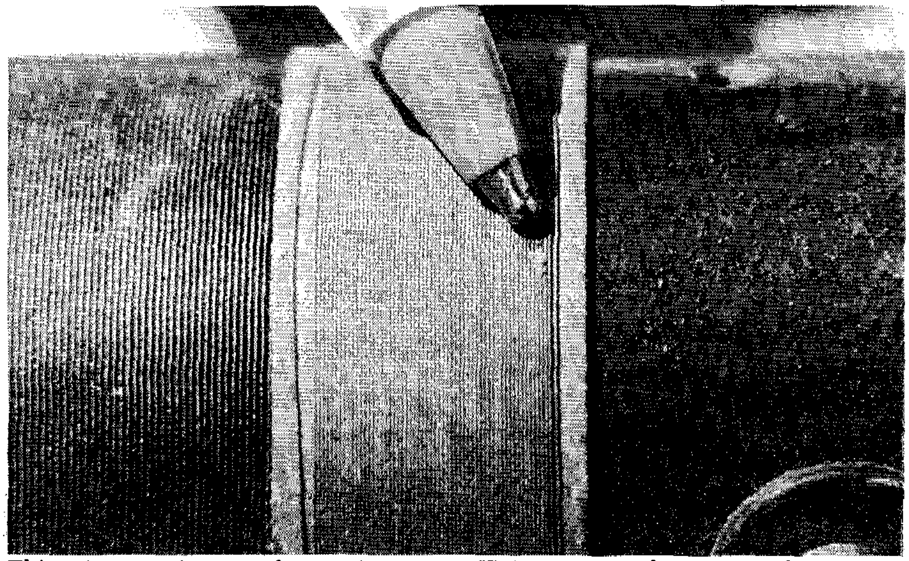
One problem encountered is that the Tasma has a few odd looking original components in it that are a little different from normal. For example, there were a number of square shaped fibre formers bolted to the underside of the chassis (see photograph). These little units are either wirewound resistors or radio frequency chokes.

The two shown in the photograph are resistors. One is the output valve's centre tapped filament resistor and this is connected to the second unit – a 500Ω cathode bias resistor. These square shaped components are not the usual readily identifiable wirewound, centre-tapped and bias resistors.

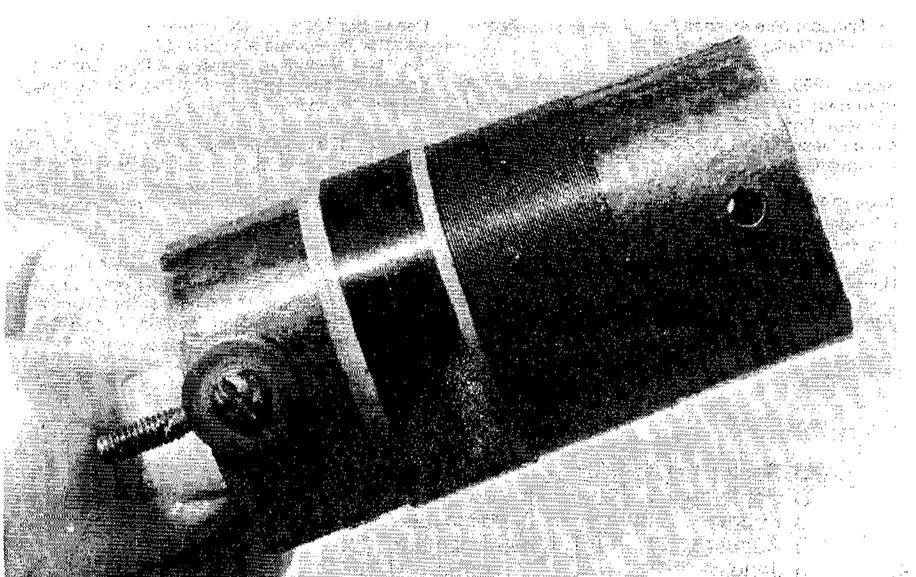
After checking out the two available loudspeakers, it was not difficult to choose one. As the Jensen had an open field winding, the Rola was the one for the job. The speaker was wired directly to the receiver (no speaker plug and socket), which makes handling the set rather awkward from then on. If it had been mine, I would have been tempted to fit a socket and plug.

Early tests

Upon trying out the Tasma, the best that could be said for it was that it was a really poor performer. This was despite that fact that the correct valve types had been fitted: two 24As, a 35, a 45 and an 80, as indicated by the



This microscopic spot of corrosion was sufficient to stop the receiver from working. In fact, the Tasma had two faulty RF coils due to "green spot" corrosion. Note that the primary winding is wound on top of the secondary winding, which made repairs much easier.



This photo shows the rewound RF coil, prior to installation in its metal cover. It was hand-wound with enamel-covered wire of a slightly different gauge & this restored it to full working order.

valve location chart inside the cabinet.

But there was a very good reason for the weak response. A close examination of the wiring underneath showed that the screen grid on one of the 24As had never been connected to the high tension supply. The screen had a bypass capacitor but no screen voltage. Running a wire from an adjoining screen grid connection to the unconnected screen gave a huge improvement to the set's performance, which improved even further when the trimmers were properly aligned.

It would appear as though this particular receiver had been a dismal performer all its life and would have given only mediocre reception on the strongest of signals.

Well that's about all there is to report on the Tasma repair. There was a lot of time and effort spent getting this one going again, believe me! While some of the repair techniques may be questionable from a purist's point of view, the nicer alternatives would have cost hundreds of dollars.

However, outwardly the receiver looks quite acceptable and it is working better now than at any other time in its life. **SC**