# COLUMBUS RECEIVER SERVICING NOTES.

**Peter Lankshear**

The Radio Corporation of New Zealand was a major local manufacturer, especially from the mid 1930's into the 1950's and there can be few established New Zealand collections without some examples, and they can be found even in Australia. Distributed nationally, the RCNZ own brand name was Columbus, but large numbers of their receivers were sold by Turnbull & Jones as Courtenay. Less common were the CQ and Pacific labels, and sometimes an "Ensign" kitset receiver using RCNZ parts will surface

With their good electrical design, Radio Corporation receivers perform well, but now, 50 years on, sets unearthed from storage are likely to need some TLC as many were "run into the ground" before being relegated to a garage or cupboard. This article is intended to assist collectors in understanding their operation when bringing sets back to life. It is impossible to deal with all models individually, but their basic designs did not change much. In any event circuits for most models are readily available and provide adequate information, including the correct voltages around each valve. Before starting work, get a copy and make yourself familiar with the set and its operation.

Avoid the temptation to switch on the receiver to "see if it goes". It is not reasonable to expect a set that has been out of use for years to be in good working order, and you may do some serious damage if some things are not checked first. As with any make of receiver, it is wise to first check the condition of the power cord and its connections. It is not unknown for an experimenter to have left a receiver in a lethal condition, with the phase connected to the chassis.

Unfortunately, Radio Corporation power transformers were not well constructed and failure was common. It is quite likely that a Beacon or similar replacement will have been fitted, but if the transformer is original, inspect it very closely. Look out for charred paper or "burnt" smells. These are danger signs that there may have been a burn out. If it is O.K. the next step is to inspect the insulation of the transformer leads. Frequently this will have been rubber, and as it is likely to have perished, renewal is essential. The best way to get access to the leads is to first remove the transformer from the chassis. This brings us to a minor difficulty in repair of Radio Corporation receivers. Before soldering, leads were threaded through tags and tightly clinched, to the extent that it is not an exaggeration to say that a freshly wired Columbus receiver could have operated without solder on the joints. This creates a restoration problem. There is little chance of separating a lead from a tag by heating the solder and tugging with a pair of pliers. Invariably the tag will break first. Many repairers simply just cut the offending lead off and "blobbed " extra solder on to secure the replacement. This not only looks rough and ready, but can be unreliable. Remember always that ideal restoration work should be indistinguishable from the original workmanship. To preserve tags and appearance the best way is to first remove the solder with a desoldering tool or "Solderwick" and then undo the leads with a sharp pointed scriber or soldering aid set as stocked by Dick Smith. A small sharp pair of diagonal cutters is very useful too. The replacement lead can then be threaded through the lug to provide a better looking joint and as a bonus it will not need a third hand to hold it in position while soldering.

The transformer can now be separated from the chassis. If it is a vertical type, remove the end covers, and after removing the crumbling insulation, slip new sleeving on to the leads. If you have any doubts about the condition of the transformer, after the lead insulation has been replaced, run the receiver for an hour or two with all valves unplugged. The transformer should only get slightly warm. IMPORTANT: Do not do this until you are certain that the insulation of the transformer leads is in good condition..

Incidentally you may discover some Columbus sets built in the late 1940's with unusual rectifier octal socket wiring, with most pins connected. This appears to have been a response to post war valve shortages so that either a 5Y3 or a 6X5 could be used. The difference in filament voltages was more or less compensated for by the poor regulation of the power transformer winding which produced around 6.0 volts with a 6X5, but the much heavier drain of a 5Y3 pulled the voltage down to nearer 5.0.

Radio Corp. was enterprising in that they made a lot of their own components, with varying degrees of success. For a proper restoration project, ALL paper capacitors should be tested for leakage. Any that test lower than 100 megohms should be replaced. This applies also to the early receivers that used TCC capacitors. Modern plastic dielectric capacitors of appropriate voltage rating make excellent replacements for paper types.

Columbus also made mica capacitors, recognisable by their plain black cases and marked only by the value. Although dielectric breakdowns are rare, these capacitors can cause some very puzzling problems by intermittently losing capacitance. I have conducted post mortems on some of these and found connections to the electrodes to have been clamped with what appear to be pieces of tin plate, not always rust free!

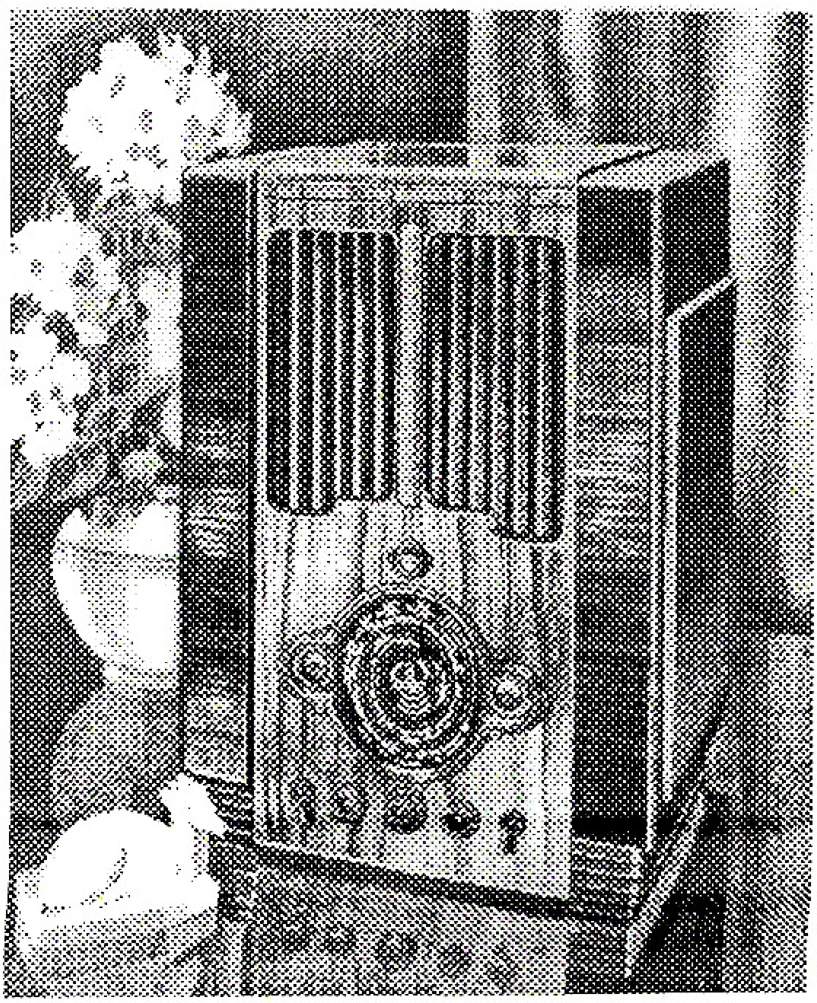
Resistors should be checked for value. Two that often will have been found to be high are the audio amplifier anode load, often .25 megohms, and the associated screen grid resistor, typically 2.0 megohms. The screen grid voltage divider to the mixer, R.F. and I.F. stages frequently comprised a 15Kohm and a 25Kohm old style carbon stick resistors. These are likely to have gone high and should be replaced. The 25K can have a 1 watt rating, but the 15K should be replaced by a parallel pair of 30K 1 watt resistors (or 2 x 7.5K in series).

For many years, Radio Corporation made their own very good loudspeakers .They are easily dismantled, about the only tricky bit being the terminal strip which is part of the output transformer. The most likely problem will be an open circuited output transformer primary, but sometimes the field may be open. It is worthwhile attempting to repair the field as the problem is often a corroded lead out wire where it contacts the bobbin. Even if the break is in the winding, with a bit of care and patience, removing the wire and then rewinding is quite straightforward. It is useful to have access to a lathe for this purpose.

I.F transformers sometimes will have an open circuited winding. Suitable replacements can usually be located, and often the internals can be transferred to the original can. As with most I.F. transformers, it is important to get the connections correct. A reversed connection will result in a considerable loss of receiver gain.

In the larger sets with an R.F. stage, the R.F. coil can have two faults. One is easy to find. There is no voltage on the anode of the R.F. amplifier valve, indicating a green spotted primary (the larger winding by the way). Another problem can be not very obvious, but has a serious effect on performance. R.F. coils have a single turn of wire from the primary wound round the outside of the tuned winding. If there is leakage between these two, high tension voltage can leak via the tuned winding to the Automatic Gain Control line. This can be hard to find because control grids of the AGC controlled valves conduct as diodes and clamp the voltage practically at zero. This problem is not peculiar to Radio Corp. receivers and can in sets with valves with top cap grid connections be checked by lifting the grid caps of the A.G.C. controlled valves and noting if any POSITIVE voltage between one of the grid clips and chassis. (There may of course be a small negative voltage. This is the normal grid bias).

Another frequently found coil problem can be a burnt out aerial coil winding. This again was not peculiar to Radio Corp. receivers, but was common in the days of large aerials. It does not need a direct lightning strike to induce a large amount of energy into an aerial, and if there was no operative lightning arrestor the receiver input winding suffered. Look for signs of charring , and if the resistance between aerial and earth is not somewhere between 10 and 50 ohms, chances are that there has been a burn out. By the way, Radio Corp. receivers often had a resistor of a few thousand ohms connected across the aerial winding. This was to prevent “birdies”, or heterodyne whistles resulting from the aerial coil resonating close to the receiver’s I.F. frequency. Many of the problems outlined are not peculiar to Columbus products, but in the writer’s experience have been regularly encountered in RCNZ receivers. These sets are an important part of New Zealand’s radio heritage, and a worthy component of any general interest collection.



**Columbus Model 43**

The louvre effect on this cabinet was said to give an even distribution of tone volume

(With acknowledgement to “More Golden Age of Radio” by John W Stokes)

# COLUMBUS & COURTENAY NOTES

by Peter Lankshear

The Radio Corporation of New Zealand made some excellent receivers and the countrywide distribution system of their extensive range of models makes it likely that most collectors will encounter these very collectable radios.

Several models, including the 66, 75 and 90 were produced over a long period and largely as a result of wartime and postwar shortages, each manufacturing run had its individual variations. The 66 in particular had many versions. A justifiably popular model, it was a no frills dual wave receiver with an R.F. stage. Variations include 66, 66A, 66E, 66J, 66W and a broadcast only 66BC.

Although some modifications were documented, there can be traps in many of the 1940's models, and two in particular are worth watching for.

1. Be on the lookout for bridging connections on the octal rectifier sockets in which pairs of pins 3&4, 5&6, and 7&8 are tied together. This seems to have been done to accommodate either 5Y3 (U50) or 6X5 rectifiers. However, as Radio Corp. did not provide valve location stickers inside their cabinets, there is no indication as to which type was intended. If both rectifiers had the same filament voltage, there would be no problem, but the 5Y3 requires 5.0 volts, whereas the 6X5 is rated at 6.3 volts. Each will work with the other's supply, but in either case there is likely to be shortened life. In my experience it is quite common t- find receivers in which the wrong valve type has found its way into the rectifier socket. The easiest way to be sure is to measure the filament voltage. If it is less than 6.0 volts, use a 5Y3. Otherwise use a 6X5GT.

2. During this same period, Radio Corp. used both the 6J8G (or its direct equivalent the X65) and 6K8G converter valves and again there is no indication as to which type was originally fitted. The 6K8(G) or(GT) has a high mutual conductance triode section and is NOT an equivalent of the 6J8G. Later the 6K8 and the ECH35, also with a "hot" triode often found their way into receivers intended for the 6J8G. To further confuse the issue, two different types of oscillator coil were used.

Generally, interchangeability is no problem, but in some cases, using a 6K8 or an ECH35 will result in an odd sort of oscillation on some parts of the tuning range. This is oscillator "squegging", resulting from too much feedback. If this happens, and you do not have a 6J8G, check the value of the mica capacitor connected to the oscillator grid, pin 5. It is likely that it will be found to be 500 pf. Substitute a 100 pf mica or ceramic capacitor for a cure.

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Courtenay
There's no compromise with Quality