REFLEXING

John W. Stokes

Defined in the simplest terms, reflexing consists of making one valve do the work of two; its greatest value being in the days when valves were very expensive and required lots of filament current, thus the elimination of one valve in a receiver was well worth while. However, by the time mains operation arrived valves were becoming cheaper and the cost of filament heating became negligible, with the result that reflexing fell into disuse and all but disappeared from the scene for several years.

One of the first examples of reflexing as applied to a mains-operated set is to be found in the 1934 Model F Kadette Jr., a diminutive American two valve TRF, the production of which would have been impracticable without resorting to the use of reflexing. In the same year, RCA's M-116 car radio provided an example of a superhet with a reflexed IF/AF stage. Elsewhere in the world, reflexing was almost non-existent, but there was one notable exception. Early in 1934 AWA in Australia introduced the first in a series of reflexed superheterodynes using very similar circuitry to that used in RCA's M-116.

Although reflexing was most commonly used in small four and five valve sets, AWA also produced some console models using the same circuitry. From this time on several other Australian manufacturers took up the use of reflexing, a practice that was to be carried on until well into the 1950s in some cases.

By comparison with Australia, reflexed receivers were almost non-existent in N.Z. where only one manufacturer ever produced any. For a short time in the late 1930s, the firm of Radio 1936 Ltd. made some 4-valve 'el-cheapo' models but thereafter abandoned the use of reflexing entirely. After the war reflexing appeared to have died a natural death, until 1952 that is. In that year the firm of Radio Corporation of NZ Ltd. rather surprisingly came up with a quite out-of-character model, their first and only reflexed set, and, incidentally, the first to incorporate an electric alarm clock. Because the circuitry of this set, the model 4, was so unlike anything previously produced by this firm, the question arises - where did the idea come from? Let's take a look into the matter.

Valve line-up consisted of 6SA7 mixer, AWV 6AR7GT operating as a screen reflexed IF/AF amplifier feeding an Osram KT61 steep-slope output tetrode. It was the particular method of reflexing, together with the oddball 6AR7GT that provided a clue to the origin of the model 4's circuitry.

If reference is made to the Radiotron Designer's Handbook, 4th Edit. 1952, it will be found that an entire chapter is devoted to the subject of reflex amplifiers. Of particular interest to this discussion is the circuit diagram shown on page 1145 (Fig. 28:3) which is almost identical to that used by Radio Corp., the main difference being that a 6A8G converter valve is used.

However another AWV circuit, Fig. 28:2, page 1144, shows the use of a 6SA7 converter and if we graft the front end of this circuit on to the other, we end up with Radio Corp's model 4. How about that? Furthermore, AWA's model 430MA of 1951 provides a commercial example of a 4-valve receiver using screen reflex circuitry which is identical to that used by Radio Corp. in their model 4 Columbus, surely proof enough of where the idea came from.

The main point of interest here is that although AWA continued to use the more common 'plate reflexing' in some of their post-war receivers, their model 430MA was the only one to use the so-called 'screen reflexing', and it was this model on which Radio Corp. based their model 4. However, the way in which AWV/AWA continued to cling to reflexing for so long is certainly something to be wondered at, particularly when a footnote to page 1140 of the above mentioned textbook comments: (quote) "Reflex receivers do not appear to be in commercial use in either USA or Great Britain at the time of writing." Surely that should have been a good enough reason for AWA not to persist with the idea. Incidentally, Chapter 28 was written by none other than Fritz Langford Smith, which makes it seem more likely that it was he who was responsible for AWA's use of reflexing in the first place, back in 1934.

Columbus model 4 (1952)

Facing page; Circuit of Columbus model 4