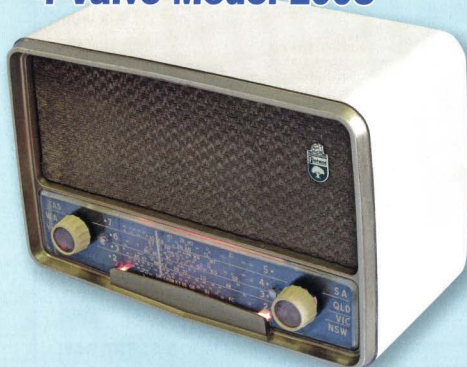


Vintage Radio

By Associate Professor Graham Parslow



The 1955 Fleetwood 4-Valve Model 1003



The Fleetwood logo depicts a sailing ship at the top and an oak tree in the bottom half to reflect the town's maritime past.

Philips in Australia

The Adelaide suburb of Hendon originally hosted an airfield but this had become vacant by the start of World War 2. Soon after the outbreak of war, a large munitions factory was built there and produced around three million .303 bullets a week (the author's mother was employed there during that time). Philips subsequently took over the buildings in 1947 and continued radio and electronics production there until 1980. At its peak in the late 1950s, some 3500 people worked for Philips at Hendon.

During the 1940s and 1950s, Philips radios were also badged as "Mullard" or "Fleetwood". There were some minor cosmetic differences between them though. For example, the circuit diagrams of the Philips Model 164 and the Fleetwood Model 1003 both appear in the 1955 Australian Official Radio Service Manual (AORSM) and are identical (these stalemates would have been made at the Hendon factory). However, apart from its logo, the Fleetwood Model 1003 is easily distinguished from the electrically-identical Philips Model 164 because it uses a cloth speaker grille rather than a metal mesh.

That aside, these two sets really are twins. Both have "4 VALVE" stamped into the fibre of their wrap-around backing panels and they have the same information on the labels (although the Philips' label is red while

The Fleetwood Model 1003 is a 4-valve set that was manufactured at Philips' Hendon plant in South Australia during the 1950s. It's a relatively simple design based on 9-pin valves and has quite good performance.

FLEETWOOD is a coastal town in Lancashire, England, north of Blackpool and like Blackpool is also a resort town. And unusually for England, Fleetwood is a planned town that was laid out in 1835.

The town's largest and most prominent single employer is currently the manufacturer of the menthol lozenge "Fisherman's Friend". In more prosperous days though, the Mullard company, a wholly owned subsidiary of

Philips since 1928, operated an electronics factory there before it closed in 1979.

The Fleetwood logo used on many Mullard radios, including the set described here, included a sailing ship. That's because deep sea fishing and cargo shipping were once the main activities of the town. The oak tree dominating the bottom half of the logo was included because oak was used to build sailing ships.

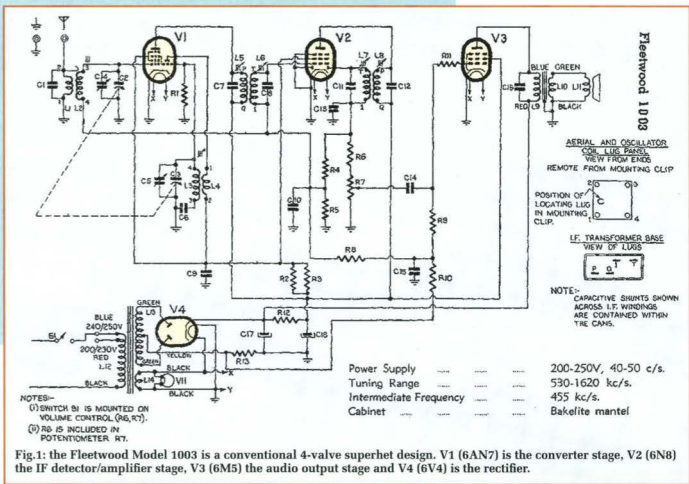


Fig.1: the Fleetwood Model 1003 is a conventional 4-valve superhet design. V1 (6AN7) is the converter stage, V2 (6N8) the IF detector/amplifier stage, V3 (6M5) the audio output stage and V4 (6V4) is the rectifier.

the Fleetwood's is green). Rather strangely, the cabinet could either be a walnut-coloured Bakelite type (as for the Model 164 shown here) or a thermo-moulded plastic type for colours such as the cream Fleetwood. In fact, this would have been one of the last Bakelite cabinets used because they were more expensive to produce and it was more fashionable to use bright colours during the 1950s to match the kitchens of the day.

Circuit details

The Fleetwood 1003 incorporated a number of the advances that were made during the 1950s, including the use of "modern" 9-pin valves to optimise various circuit functions. The result is a 4-valve radio that's a solid performer in reasonable signal strength areas. Alternatively, a buyer in 1955 could have paid slightly more to acquire the Philips 5-valve Model 165 in the same moulded case.

Fig.1 shows the circuit details of the Fleetwood Model 1003. It's a conventional superhet design with V1 (6AN7) operating as the converter, V2 (6N8)

as an IF detector/amplifier stage, V3 (6M5) as the audio output stage and V4 (6V4) as the rectifier.

Unlike the Fleetwood set, the Philips 5-valve model 165 uses two valves to achieve IF amplification, detection and AGC - see Fig.2. In this circuit, V2 is a 6BH5, while V3 is a 6BD7 which subsequently drives a Philips Miniwatt 6M5 output pentode. By contrast, in the Fleetwood circuit (Fig.1), a single 6N8 (V2) performs IF amplification, detection and AGC.

Either way, it makes no difference to the performance. The author has a Model 165 to compare with the Fleetwood and finds it impossible to distinguish between them on listening tests.

The 9-pin 6M5 power pentode (V3 in the Fleetwood) has a gain of 22 in typical use and this is adequate to avoid the need for extra preamplification after the IF stage. In fact, R6 is a 400kΩ series resistor that's actually built into the 100kΩ volume pot (R7) to reduce the signal that's fed from the 6N8 to the 6M5 audio output valve. The 6M5 can easily deliver 3W of audio, which is more than enough to

drive the 5-inch (125mm) Rola model C speaker used in the Fleetwood into overload.

The 6M5 valve was common in many radios of the 1950s and 1960s, by the way.

Restoration

One of the first things I noticed when

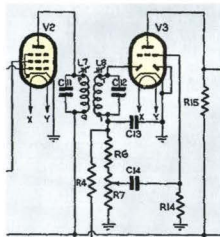


Fig.2: unlike the Fleetwood set, the Philips 165 uses two valves for IF amplification, detection and AGC.



In addition to its distinctive logo, the Fleetwood Model 1003 (left) is easily distinguished from the electrically-identical Philips Model 164 (right) because it uses a cloth speaker grille rather than a metal mesh grille.

VALVE EQUIPMENT AND VOLTAGE ANALYSIS

Valve Function	Valve No.	Valve Type	Plate Volts	Screen Volts	Osc. P. Volts
Frequency Converter	V1	6AN7	210	55	55
I.F. Amplifier, Demodulator and A.V.C.	V2	6N8	210	55	—
Power Amplifier	V3	6M5	208	210	—
Rectifier	V4	6V4	V4 cathode — L13 C.T., 232V.		
Dial Lamp	V11	6.3V, 0.32A tubular screw			
Voltage across R13, -6.7V					

Fig.3 (above): this chart lists the valves used in the Fleetwood 1003 and their screen and plate operating voltages.



The Philips Model 164 and Fleetwood Model 1003 are virtually identical. Even the labels on the back are the same, except that one is red and the other is green.

I acquired my Fleetwood 1003 was that green corrosion spots were apparent in the gold finish of the facia. This suggests that the gold finish was formulated in part with copper.

In addition, the speaker cloth on the Fleetwood had been badly stained down the lefthand side by a green-black goo that had also dribbled onto the gold trim and the tuning dial. This

goo appeared to be acidic and had created a copper salt wherever it had affected the finish.

The solution to this cosmetic problem was to remove all the parts from the case (as described later) and thoroughly clean it and the grille with degreaser. The black dial background and the cream sections of the cabinet were then covered with masking tape and paper, after which the exposed facia and grille fabric were sprayed with gold paint.

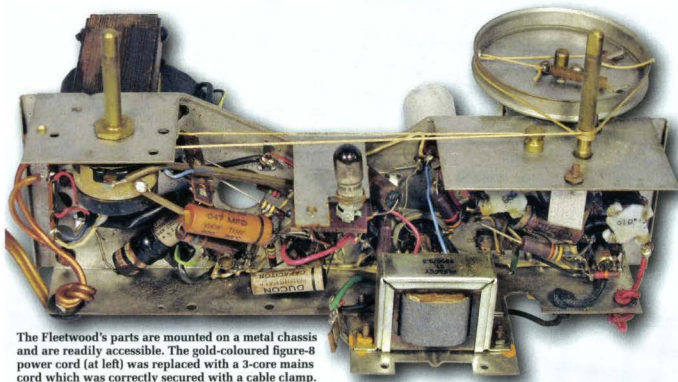
Although it is not an intuitive thing to do, speaker grille fabric takes paint well and in this case, the result was quite good. The cream feature-strip at the front of the case was then restored by sanding off the new gold coating with fine-grit sandpaper.

Beginner's trap

By the way, there's a beginner's trap built into all the Philips clones that use this cabinet. Indeed, I have been guilty of breaking a perfectly good dial cord on one of these sets.

To the uninitiated, it seems that all that needs to be done to remove the chassis is remove the knobs and then slide the chassis out. However, Philips didn't make it that simple. They can be annoying in their engineering designs and they get my vote for the manufacturer who most consistently made disassembly difficult.

In these sets, the dial pointer is awkwardly poked up from under the back plate behind the dial assembly and if you simply tug on the chassis, the dial cord breaks. The correct procedure is to first remove the plastic calibrated



The Fleetwood's parts are mounted on a metal chassis and are readily accessible. The gold-coloured figure-8 power cord (at left) was replaced with a 3-core mains cord which was correctly secured with a cable clamp.

dial panel at the front (two screws) and then guide the dial pointer under the backplate that is part of the cabinet moulding as the chassis is withdrawn.

In my radio, the dial had already been restrung but with ordinary string rather than dial cord. This suggests that someone else had previously fallen into that beginner's trap. Despite using ordinary string, the restrung dial worked quite well, so I left it as it was.

Another aspect of this radio is that the Rola 5C speaker is tightly clamped into a circular groove in the back of the case moulding. This makes an effective baffle for the speaker but means that the speaker's wires must be desoldered to remove the chassis.

Chassis work

My Fleetwood 1003 radio was received in working order and all the parts under the chassis appeared to be in good condition. That meant that there was little to do other than tidy up the rather messy layout. Indeed, one essential chore was to replace the rather stylish gold figure-8 2-core flex with a 3-core mains power cord and to properly secure this with cable clamps.

The speaker transformer at the bottom was still lustrously metallic and clearly stamped Plessey-21-5000/3.5 (the latter numbers designating the input and output impedances in ohms).



The chassis can be slid out of its plastic cabinet after the knobs have been removed but you also have to be sure to remove the dial panel and guide the dial pointer under the dial backplate as you do so. This view shows the chassis after restoration.

As an aside, Plessey took over Rola, based at Richmond in Melbourne, in the mid-1960s.

The top of the chassis carried the classic "miniature" Philips IF transformers of the era. It also featured the

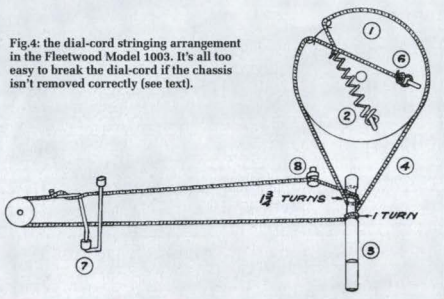
characteristic Philips compact tuning condenser with brass plates that was carried over to early Philips transistor radios.

One problem was that a large amount of dust had covered the valves and



This rear view shows the Fleetwood 1003 fitted with its punched fibre-board cover. The two leads at lower left are for the antenna and earth connections.

Fig.4: the dial-cord stringing arrangement in the Fleetwood Model 1003. It's all too easy to break the dial-cord if the chassis isn't removed correctly (see text).



other parts on the top of the chassis – this despite the back of the set being protected by a punched fibre-board cover. This dust and any associated grime were removed by brushing the parts with mineral turpentine and then air-blowing the chassis dry.

ARTS&P label

Prior to this clean-up, a small fragment of the ARTS&P label had been evident on the chassis to the left of the power cord grommet. I sometimes replace a missing or damaged ARTS&P label with a reproduction but in this case it wouldn't be seen with the back-plate installed, so it was omitted.

Pitted dial plastic

One blemish that couldn't be repaired was the pitted area of the dial plastic where the corrosive goo had etched into it. Even a deep polish using old Brasso failed to go deep enough to remove this pitting. Old Brasso, by the way, is formulated with kaolin and quartz instead of silica for the abrasives and the suspension compounds do no harm to most plastics. On the contrary; those fine abrasives restore most plastic surfaces to spectacular clarity.

Unfortunately, the Brasso formula changed in 2008 to comply with US volatile organic compounds laws and the new formulation cannot be used on some plastics. I am now down to my last few millilitres of the old Brasso, so I will have to find a suitable substitute.

Finally, the Fleetwood's cream cabinet would easily blend with any decor and the radio is relatively small, with a width of just 280mm. The set is perfectly functional and its appearance respectable enough to be placed in any modern kitchen.

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