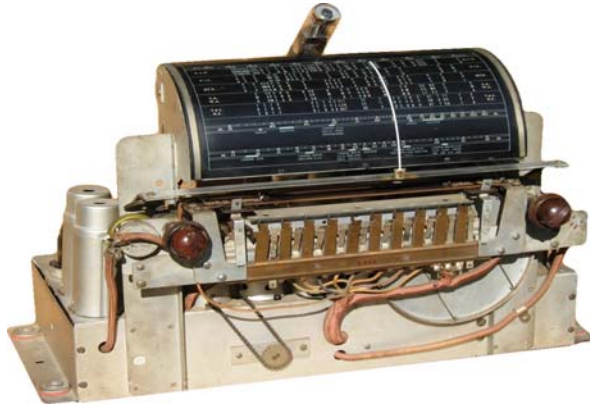


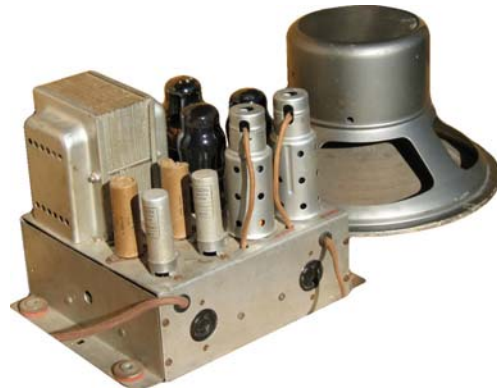
The Radiola 281

Warwick Woods.

Released by AWA in 1939, the R281 is a thirteen valve, plus 'Magic Eye', receiver incorporating motorised push button tuning, variable selectivity, push-pull output feeding a 12 inch speaker, AFC, (automatic frequency control), and tunes the broadcast and two short-wave bands. Provision is also made for the attachment of an 'Armchair Remote Control' unit, (at the end of 8 metres of cable!). It certainly must have been one of the most elaborate domestic receivers of its time and has a number of interesting features; along with a shipping weight of 77 kg.



The set is built on two chassis, the first containing the main receiver section and the second the power supply and audio output stage; the latter chassis being mounted in the lower section of the cabinet. Quoted power output is 13 Watts and with the 'Fidelity' control in the 'Wide Range' position the frequency response is claimed to be from 40 Hz to 7.5 kHz.



A two section low pass filter is fitted in the anode circuit of the 6R7-G first audio amplifier with the cut-off frequency starting at 7 kHz and having maximum cut-off at 10 kHz. This is intended to reduce whistles and background frequencies above 10 kHz which, according to the set's brochure, contain mostly noise.

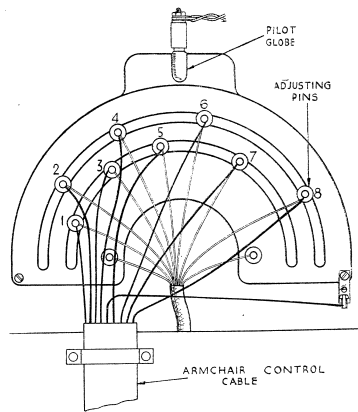
The selectivity and tonal response is controlled by a seven position 'Fidelity Control' that also interacts with some of the other switches in, initially, a slightly confusing way.

Position of Fidelity Control	Selectivity 1st I.F. Trans.	Selectivity 2nd I.F. Trans.	Audio Response	A.F.C.	Automatic Station Selection	Use
1	Normal	Normal	Reduced High Frequencies	Inoperative	Inoperative	*Short Wave and Distance tuning, with reduced "Treble" response
2	½ Broad	Normal	Normal	Inoperative	Inoperative	*Short Wave and Distance tuning, with increased "Treble" response
3	Normal	Normal	Reduced High Frequencies	Operative	Operative	Local and Med. Distance tuning, with reduced "Treble" response
4	Normal	Normal	Normal	Operative	Operative	Local and Med. Distance tuning, with "Normal" response
5	½ Broad	Normal	Normal	Operative	Operative	Local tuning, with increased "Treble" response
6	½ Broad	½ Broad	Normal	Operative	Operative	Local tuning with further increased "Treble" response
7	Broad	Broad	Normal	Operative	Operative	Local tuning with "Wide Range" response

* Automatic tuning is not provided in these settings, but "Scanning" is available.

Eight push button switches are used to select the pre-set broadcast band stations while two further buttons select manual tuning or the gramophone input.

To set the pre-set buttons to the desired stations, it is necessary to (1) set the 'Fidelity' control to position 1, (2) press the 'Manual' button, (3) manually tune to the desired station, (4) hold the 'Manual' key down and press pre-set key No 1; both keys will stay down, (5) move adjusting pin No.1 along the slot until the



Automatic adjusting pins and Armchair Control connections.

pilot globe mounted above the adjusting pins is extinguished. This operation is then repeated for the remaining seven buttons.

When manual tuning is selected two ‘Scan’ buttons are enabled and these, when held depressed, connect the motor and drive the pointer back and forth across the dial to the desired station. Due to the high gearing of the main tuning knob, this is a quicker way of tuning across the band.

A push switch on the main tuning control defeats the AFC when tuning manually. When the tuning motor is in operation a further switch on the motor shaft also defeats the AFC and a signal from the motor is fed back to the diodes of the 6R7-G so that the audio is muted for silent tuning between stations.

Rotating the band selector switch also illuminates the broadcast or either of the short-wave sections on the large dial. Instead of switching different dial lamps for the three sections, the two fitted lamps are attached to a light shield that rotates to only illuminate the section of the dial for the band selected. While this does save some extra lamps and switch contacts, it does complicate the mechanical operation and careful adjustment of the various linkages is necessary to ensure that only the required section of the scale is illuminated.

The valve compliment is: 6U7-G RF Amplifier, 6K8-G Mixer, 6J7-G separate Oscillator, 6J7-G Oscillator Control, 6U7-G 1st I.F. Amplifier, 6U7-G 2nd I.F. Amplifier, 6H6-GT Detector, AVC and AFC, 6R7-G 1st Audio, 6J7-G 2nd Audio, 6J7-G Phase Splitter, two 6V6-G Output, 5V4-G Rectifier and 6U5 Tuning Indicator.



The inclusion of AFC is not common in domestic receivers of this vintage. The function of the AFC circuit is quite complex but in simplified terms, it automatically changes the frequency of the heterodyne oscillator so that the correct intermediate frequency is provided for the I.F. Amplifier. The circuit consists of an I.F. Discriminator, part of the 6H6-GT, that provides a control voltage of the correct polarity to the Oscillator Control valve which in turn adjusts the frequency of the 6J7-G Oscillator valve. This corrects any drift in the oscillator and ‘locks in’ the selected station.

As purchased the set was claimed to be in working condition and did function. However careful examination revealed that the person responsible for previous repairs had a fairly casual regard for component values and one electrolytic was missing from the power supply along with the Non-Polarised electrolytic fitted across the motor windings. The voltage ratings of the remaining electrolytic were also ‘close to the wind’. Some of the original paper capacitors had been replaced with Japanese Oil Filled Paper types from the 1960’s and 70’s and these components, while being much younger than the originals, are notorious for leaking. While some of the values used in some positions would not have affected operation, (an exception being the low-pass filter mentioned earlier), it was decided to replace the lot with the correct values and ratings. Since the Non-Polarised electrolytic fitted across the motor was visible, its bright green replacement was fitted into the cardboard case of an older style component to preserve appearance.

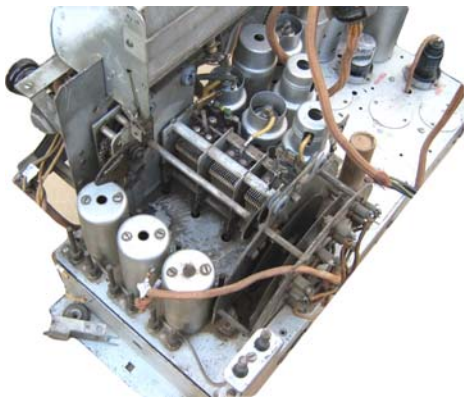
Several resistors had gone high in value and these were also replaced. A total of six valves needed replacing including the rectifier and tuning indicator that had both been previously replaced by incorrect types.

After a further careful inspection for any other possible problem areas, power was applied and the set burst into life.

While most of the controls appeared to be operating normally, operation of the manual tuning obviously had problems. When using the tuning knob it is necessary to push the knob inwards to operate the AFC defeat switch. Upon releasing the switch the station tuned should lock in; unfortunately, instead, the station completely detuned, meaning that the AFC was doing the reverse of what it should.

A number of other switch contacts that were operating intermittently also needed to be disassembled and cleaned before any further trouble shooting could be performed.

Now back to the AFC problem! A close examination of the adjusting threads on the I.F. transformers revealed plenty of evidence of ‘fiddling’, mostly by the wrong sized tool. In particular the service information states that the core for L26 and 27 is set in the factory for an exact balance of these two coils and should not be disturbed; this core had been screwed right out! No wonder the AFC was performing strangely. Fortunately the service information provided a mechanical dimension for the position of the adjustment and the core was reset to this position.



The remainder of the I.F. adjustments were performed in the usual way but the final adjustment of L28 in the discriminator circuit required the use of two signal generators simultaneously!

After all of this the AFC worked correctly.

The motor providing the drive for automatic tuning was a small unit that relied on gearing for sufficient power to drive the tuning capacitor and the pre-set switching assembly. After cleaning old grease from the various gears the motor worked well in one direction but struggled in reverse. A closer look at the motor frame mounts revealed collapsed rubber mounting grommets and it was necessary to remove the whole assembly

so that these could be replaced. With new grommets fitted the motor worked smoothly in both directions.

The R281 was now working as AWA intended. The background noise was very low and the sensitivity was good on both broadcast and short-wave bands. With the speaker mounted back in the cabinet the audio performance was good but the operation of the ‘Fidelity’ control could best be described as subtle rather than dramatic.



The operation of the various switches and their interaction could have made operation a little confusing for a non technical owner and the setting of the pre-set station selection(s) would presumably have been left to an installer.

Housed in an attractive cabinet, the R281 is an elaborate receiver with some interesting technical features. It would undoubtedly have attracted a premium price in its day and has made a worthy addition to its owner’s collection.

My thanks to Chris Rogers for supplying the subject for this article.

