

SERVICE DATA MANUAL

THIS Service Data Manual is issued to authorised Healing Distributors and Dealers to enable them to have a practical understanding of Healing Radio Receivers.

Installation, operation, and general service instructions are fully dealt with.

Pages 3 to 9 illustrate circuit diagrams of 1934 receivers. Pages 15 to 46 contain complete service data and circuit diagrams of 1935 receivers.

Later information will be forwarded from time to time for inclusion in this Manual.

Australian Made
Healing
Golden Voiced
RadiO

NECESSARY TEST APPARATUS

To enable satisfactory service to be given on the present-day receiver the following instruments must be available:—

D.C. Voltmeter, 1000 ohms per volt. Ranges: 0—10V.—50V.—250V.—750V.

D.C. Milliampmeter, 0—100.

Continuity meter.

A.C. Voltmeter (see Output meter).

Signal Generator (modulated R.F. oscillator).

Output meter.

For preference, the Continuity Meter should have two ranges. A high resistance one for resistors, etc., and a low resistance one for tuning coils, etc.

The Signal Generator should have a suitable range, including the Broadcast Band (1500-550 K.C.), 465 and 175 K.C. The output voltage should be variable to permit adjustment of the receiver.

If the Output Meter is of the rectifier type of A.C. instrument, it may be used to measure any A.C. voltage within its range at supply frequencies.



HEALING SERVICE MANUAL

INDEX

Models	Page	Models	Page
403 and 43	3	47B	95
73-1	3	427B	97
24	4	407B	99
34	4	57B	101
44	4	527B	103
54	5	417A	105
64	5	517A	107
34B	6	57A	109
44B	6	557A	111
64B	7	667B	113
44C	7	567E	115
44F	7	General Notes (1938)	117
1934, 5 valve, A.C.-D.C.	8	447G and 448G	119
1934, 6 valve, A.C.-D.C.	8	308E	121
1934, 32 volts D.C.	8	408E	123
1934, 6 valve, D.C.	9	428E	125
Service Notes	11	418E	127
25E	15	4488E	129
35E	19	448E	131
45E	23	558E	133
65E	27	558C	135
35B	31	408B	137
55B	35	48B	139
65B	39	58B	141
55C	43	418A	143
55D	47	518A	145
Service Notes	51	508A	147
36E	53	668A	149
46E	55	408A	151
46M	57	General Notes (1939-40)	153, 154
446E	59	L308E, 329E, 62	155
56E	61	409E, A409E, 49E, A49E	157
556E	63	A449E, 499E, A499E	159
46B	65	A599E	161
56B	67	409C	163
556B	69	A449C	165
56A	71	A599C	167
47M	73	409B, 49B, 400B, 401B	169
417E	75	599B	171
427E	77	49A	173
47E	79	559A, 599A	175
447M	81	A699A	177
4477E	83	550E	179
447E	85	575E, 576E	181
777E	87	500E, 525E, 526E	183
47C	89	675E	185
57C	91	500B	187
447C	93	525A	189

GENERAL SERVICE NOTES

OPERATION.

The more sensitive and selective a receiver is the more necessity there is for care in tuning, as improper tuning will result in poor reproduction.

Carefully adjust the indicator to the centre of the station signal, keeping the volume level low. Then adjust the volume to the desired level.

NOISE.

Certain background noise will be present with the signal:

- (a) When receiving a weak or distant station.
- (b) Using too small an aerial.
- (c) The signal fading.
- (d) Local interference.

A very small percentage of the noise is due to the receiver, and this may be checked by leaving the volume control set for normal reception, tuning the set off the station, and then disconnecting the aerial and earth. The receiver will then be found to make little or no noise.

When the receiver is equipped with Automatic Volume Control an increase in the noise will be noticeable, not due to the introduction of this control, but its action in relation to sensitivity. When the receiver is to be tested for noise as stated above, the R.F. Amplifier will automatically turn full on, and amplify any small signal that may be impressed on the input circuit.

SELECTIVITY.

A.V.C. has the effect of making a receiver appear broad, due to the automatic control of the R.F. Amplifier, and as the receiver is tuned to the station the signal causes the control to adjust the amplifier and so maintain a constant level over the entire audible width of the signal. For this reason the receiver will reproduce less noise and swish when the indicator is correctly tuned, and the amplification is low, as compared with when the indicator is tuned on either side of the signal, and the amplification is much higher, to give the same output.

In an ordinary set this control is adjusted manually, and unless the volume control is turned full on the same apparent width of signal will not be noticed. In addition, the indicator needle travels through 270 degrees in comparison with the older method of rotating it on the condenser shaft through 180 degrees. Therefore for the same selectivity in each case the station signal will show $1\frac{1}{2}$ times the width on the 270 degree scale.

Great care has been exercised in receiver design and construction to keep noise level values as low as possible, while retaining maximum sensitivity and selectivity.

Local interference, though difficult to eliminate, may be reduced by the installation of an efficient aerial—earth system, but should not be troublesome when using the service of local and more powerful stations.

There is no method of completely overcoming interference from static, and it must occupy a certain percentage of the programme time.

A few of these points carefully explained to the Healing owners will help them to understand why radio listening cannot always be expected to be perfect, and that due allowance must be made for these things which we are unable to control.

General Service Notes

LINING.

Notes.—When making lining adjustments the volume control should be turned full on, and a signal weak enough not to operate the A.V.C. fed into the amplifier. The output indicator should be fairly sensitive to allow this.

The oscillator trimmer should not be adjusted unnecessarily, as its adjustment is very critical, and dial readings will be affected. If any adjustment is necessary the trimmer should be left in such a position that the bottom of the broadcast band—1500 K.C., comes at about three divisions from the zero end of the dial.

When the adjustment is complete check the H.F. end of the band (1500 K.C.), and the L.F. end (550 K.C.), to make sure the tuning range of the receiver is normal.

Method.—Firstly, the I.F. transformers must be peaked at 175 K.C., or the frequency stated for the receiver. A suitable oscillator should be coupled to the control grid of the oscillator modulator valve of the receiver—preferably through a small fixed condenser of about .00025 Mfd. capacity. The four I.F. trimmers should then be adjusted until maximum output is obtained. In most cases it is necessary to readjust these trimmers several times before they are properly peaked.

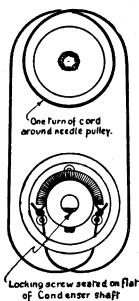
Next, couple the test oscillator to the aerial circuit and select a signal near the bottom of the broadcast band on about 1400 K.C. and adjust all except the oscillator trimmer on the condenser gang for maximum output. A signal of 600 K.C. is next selected for trimming the padder condenser. While adjusting this, follow the signal by moving the station selector knob until the point of maximum output is reached. Return to the 1400 K.C. position and again adjust all gang trimmers except the oscillator. It is advisable to go over the procedure until no further improvement can be made, the final adjustment being made at the H.F. end (1400 K.C.).

I.F. TRANSFORMERS.

The adopted colour scheme for I.F. transformers is:—

Primary:	Plate	Blue
	High Tension	Maroon
Secondary:	Grid	Black
	Grid return	Grey

DIAL.



The indicator is correctly synchronised with the tuning condenser at the factory. The adjustment is arranged so that when turned in each direction by the dial mechanism, the needle pulley segment reaches the stop at exactly the same time as the tuning condenser reaches the extremes of its movement, and therefore no further adjustment is necessary.

A new cord may be installed as shown in the diagram without upsetting the adjustment, as the whole assembly is self-synchronising. The length of the cord is $16\frac{3}{4}$ inches, and should be tied as the original.

The celluloid disc pulley should be refastened with the locking screw seated in the centre of the flat portion of the condenser shaft.

HEALING

General Service Notes

POSSIBLE FAULTS AND THEIR CAUSES FOR ALL MODELS.

NO SIGNALS.

- No power at outlet.
- Speaker disconnected.
- Grid clip shorting to shield, or not connected.
- Defective Speaker.
- Disconnection in wiring.
- Broken-down Condenser.
- Open circuit Condenser.
- Open circuit Resistance.
- Broken Battery Wire.
- Corroded Terminals.
- Run-down Batteries.
- Blown Fuse.
- Open circuit impedance or transformer.

NO SIGNALS, BUT AUDIO AMPLIFIER GOOD.

- Defective Volume Control.
- Open coils or I.F. Transformer.
- Short circuit in Condenser Gang.
- Short circuit in I.F. Trimmers.
- Faulty Resistors or Condensers.

WEAK SIGNALS.

- Trimmers out of adjustment.
- Low Line Voltage.
- Low Batteries.
- Defective Aerial Bobbin.

POOR QUALITY.

- Shorted electrolytic Condenser on bias resistor.
- Defective Coupling Condenser.
- Speaker Cone out of adjustment.
- Defective Resistors or Condensers.
- Faulty Valves.
- Batteries low.

EXCESSIVE HUM.

- Faulty Valve.
- Faulty Power Transformer.
- Faulty Electrolytic Condensers.
- Open Grid Circuit.

FADING.

- Natural causes.
- Valves.
- Defective Aerial-Earth Installation.
- Bad connections.
- Faulty Batteries.

NOISES.

- Static, etc.
- Defective House Installation.
- Noisy Valves.
- Faulty by-pass Condenser.
- Faulty Impedance or Transformer.
- Batteries faulty or Connections dirty.
- Faulty connections in circuit wiring.
- Faulty Aerial-Earth Installation.