33

SERVICE BULLETIN

SERVICE BULLETIN No. 14

D204-

Second Edition : August, 1936.

MODEL 33 : ALL-WAVE METAL VALVE RECEIVER.

"SEMPER FIDELIS" (Rear escutcheon)

RADIO CORPORATION OF NEW ZEALAND LTD

Model 33 2nd Edit

2:3A

SERVICE BULLETIN No. 14

Second Edition : August, 1936.

MODEL 33 : ALL-WAVE METAL VALVE RECEIVER.

1. **GENERAL:** The circuit of this model has been considerably revised, based on the performance of the original version in the field. The major effect is to reduce the rather high noise level present in the original model due to its excessive sensitivity.

On the broadcast band the biassing is so arranged that the radio-frequency valve functions as a high-gain amplifier, while the intermediate frequency amplifier has a low gain only, thus assuring a minimum noise level on this band. On the short-wave bands the intermediate frequency amplifier is opened out to give maximum signal with effective automatic volume control. The first two intermediate frequency transformers are air-cored with tapped-down secondaries, while the final transformer is iron-cored to give optimum diode performance.

An interesting feature is the fact that, on the highest frequency band, the oscillator is tuned to a **lower** frequency than the radio-frequency circuits. This enables better tracking to be obtained, as will be noted by the absence of a padding condenser on this band. The line-up is carried out at the high-frequency end of the band only, and it is important that the necessary equipment is available for this purpose. The "image," of course, will appear at approximately one megacycle **higher** on the dial than the fundamental frequency.

2. **ELECTRICAL SPECIFICATIONS :**

Power Supply	225-250 volts, A.C., 50 cycles	
Power Consumption	Approx. 70 watts	
Undistorted power output	3 watts	
Valves used	Radio-frequency amp.	6K7
	Frequency changer	6A8
	1st I.F. amplifier	6K7
	2nd I.F. amplifier	6K7
	Detector—A.V.C.	6H6
	Audio amplifier	6F5
	Output pentode	6F6
	Rectifier	5Z4
Intermediate frequency	456 kc/sec.	
Broadcast band	550-1500 kc/sec.	
Intermediate H.F. band	2.8-8.4 mc/sec.	
High frequency band	7.8-22 mc/sec.	
Line-up frequencies	Intermediate frequency	456 kc/sec.
	Broadcast band	600 and 1400 kc/sec.
	Intermediate H.F. band	3 and 7 mc/sec.
	High frequency band	20 mc/sec.

3. **VOLTAGE TESTS—A.C.:**

High tension secondary of power transformer, from each rectifier plate to ground ..... 290 volts (350V?)
Heater of rectifier ..... 5 volts
All other heaters ..... 6 volts

D.C.:

Unfiltered D.C. voltage, rectifier heater to ground ..... 360 volts
Filtered D.C. voltage, speaker field to ground ..... 250 volts

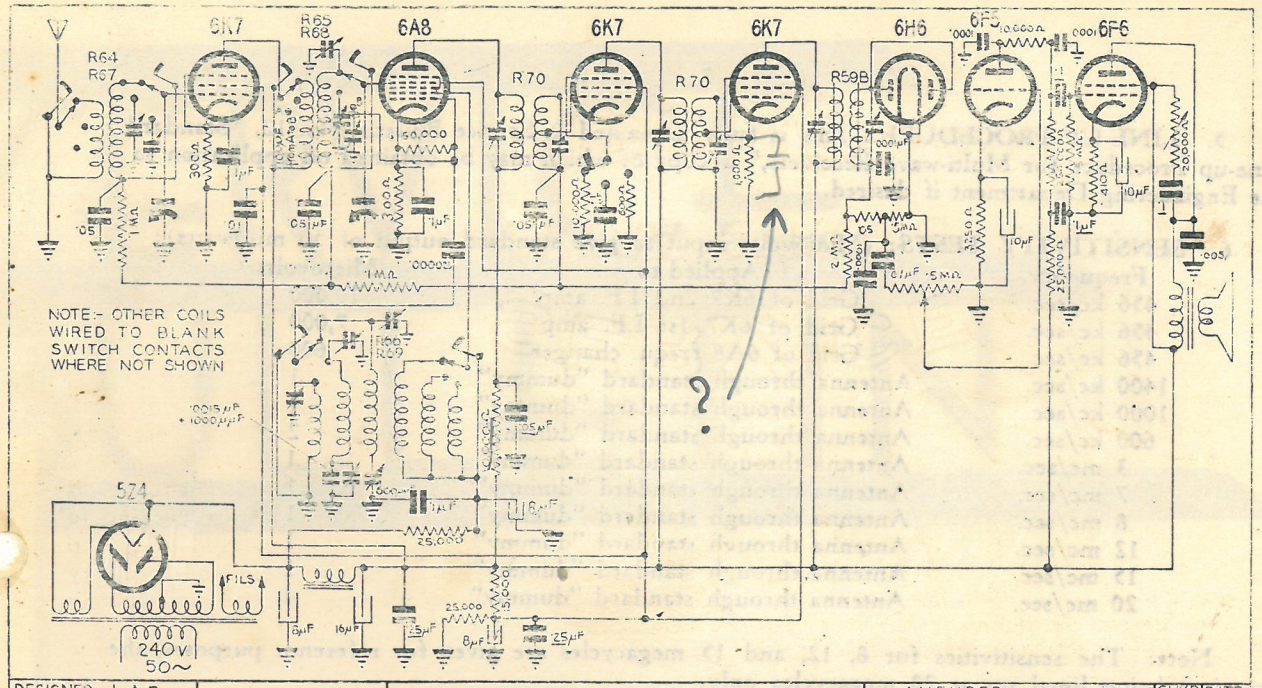
Other voltages to ground, using 1000 ohm per volt meter on 500 volt range except where otherwise stated:—

Valve.	Function.	Plate.	Osc. Plate.	Screen.	Cathode.
6K7	R.F. amp.	250 240	—	95 90	3.0* 3.0*
6A8	Freq. chgr.	190 165	180 150	95 90	3.5* 3.4*
6K7	1st I.F. amp.	250 240	—	95 90	12.0† 3.5*
6K7	2nd I.F. amp.	250 240	—	95 90	5.4* 5.0*
6H6	Detector-AVC	—	—	—	—
6F5	Audio amp.	95 95	—	—	1.0* 1.0*
6F6	Output	235 225	—	250 240	15.0† 14.5*

Note : The first column of voltages in each case is for the broadcast band, the second column being for the high-frequency band.

*10 volt range.

†100 volt range.



4. RESISTANCE TESTS :

Coil.	Where Measured.	Resistance in Ohms.
Power tran. Primary	Across power cord	Approx. 43
H.T. secondary	Each rectifier plate to ground	Approx. 250-300
Speaker field	"Fil" of speaker socket	1500
Speaker input tran.	"P" to "G" of speaker socket	Approx. 500
1st I.F. primary	See circuit	Approx. 19
1st I.F. secondary	Grid to AVC end	Approx. 9
1st I.F. secondary	Total winding	Approx. 18
2nd I.F. primary	See circuit	Approx. 18
2nd I.F. secondary	Grid to AVC end	Approx. 9
2nd I.F. secondary	Total winding	Approx. 18
3rd I.F. primary	See circuit	Approx. 9
3rd I.F. secondary	See circuit	Approx. 9
Broadcast ant. primary	7 to 5 of Coil R 64	Approx. 24
Broadcast ant. secondary	1 to 3 of Coil R 64	Approx. 7
Broadcast R.F. primary	7 to 5 of Coil R 65	Approx. 65
Broadcast R.F. secondary	1 to 3 of Coil R 65	Approx. 7
Broadcast osc. primary	5 to 7 of Coil R 66	Approx. 2
Broadcast osc. secondary	1 to 3 of Coil R 66	Approx. 5
Intermed. H.F. ant. primary	7 to 5 of Coil R 67	Approx. 7
Intermed. H.F. ant. secondary	1 to 3 of Coil R 67	(Short circuit)
Intermed. H.F. osc. primary	7 to 5 of Coil R 68	(Short circuit)
Intermed. H.F. osc. secondary	1 to 3 of Coil R 68	(Short circuit)
Intermed. H.F. R.F. primary	5 to 8 of Coil R 69	Approx. 1
Intermed. H.F. R.F. secondary	1 to 7 of Coil R 69	(Short Circuit)
High-freq'y ant. primary	7 to 6 of Coil R 67	Approx. .5
High-freq'y ant. secondary	2 to 3 of Coil R 67	(Short circuit)
High-freq'y R.F. primary	7 to 6 of Coil R 68	Approx. 1
High-freq'y R.F. secondary	2 to 3 of Coil R 68	(Short circuit)
High-freq'y osc. primary	8 to 6 of Coil R 69	Approx. .6
High-freq'y osc. secondary	2 to 3 of Coil R 69	(Short circuit)

2nd edit

5. **LINE-UP PROCEDURE**: This is fully explained in Service Bulletin No. 12, "Standard Line-up Procedure for Multi-wave Receivers," a copy of which may be obtained on application to the Engineering Department if desired.

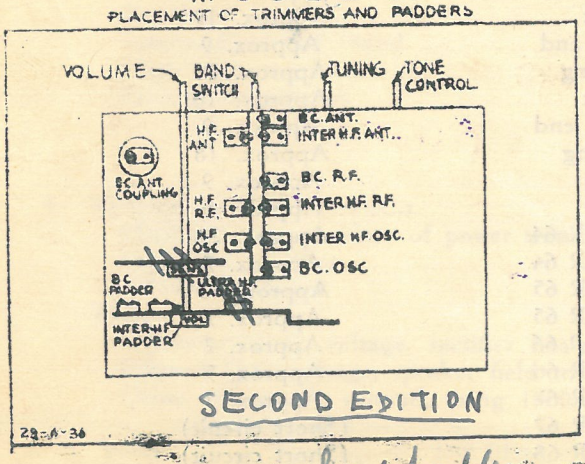
6. **SENSITIVITY TESTS:** (Microvolts input to give standard output of 50 milliwatts):

Frequency.	Applied to	Microvolts.
456 kc/sec.	Grid of 6K7 2nd I.F. amp.	10,000
456 kc/sec.	Grid of 6K7 1st I.F. amp.	7,000
456 kc/sec.	Grid of 6A8 frequ. changer	600
1400 kc/sec.	Antenna through standard "dummy"	1
1000 kc/sec.	Antenna through standard "dummy"	1
600 kc/sec.	Antenna through standard "dummy"	2
3 mc/sec.	Antenna through standard "dummy"	1
7 mc/sec.	Antenna through standard "dummy"	1
8 mc/sec.	Antenna through standard "dummy"	1
12 mc/sec.	Antenna through standard "dummy"	1
15 mc/sec.	Antenna through standard "dummy"	1
20 mc/sec.	Antenna through standard "dummy"	1

Note: The sensitivities for 8, 12, and 15 megacycles are given for reference purposes, the receiver being lined up at 20 megacycles only.

7. **GRAMOPHONE CONNECTION**: Owing to the very limited demand for gramophone connections, it is not standard practice to include such arrangements in ordinary models, but to supply details for the necessary modifications to be made. The circuit is shown and described in Service Bulletin No. 13, "Gramophone Attachment to Standard Model Receivers." The only parts required are one D.P.D.T. switch, one pick-up jack (or two terminals), and the requisite length of twin shielded wire. This bulletin is obtainable on application to the Engineering Department, and the factory can, if necessary, supply the above parts already wired for connection to the receiver, at a nominal charge.

MODEL 33
PLACEMENT OF TRIMMERS AND PADDERS



SECOND EDITION

no UHF band padder
no sensitivity control

Error in this diagram

MODEL 33