TECHNICAL INFORMATION

BULLETIN No. 104.

(TYPE)

"RADION" GLOUCESTER 7-VALVE A.W. RECEIVER. 1935

RECEIVER

COLLIER & BEALE LTD.

WELLINGTON

TECHNICAL DATA.

OF THE "RADION" GLOUCESTER.

7-VALVE AW. RECEIVER.

This Receiver uses seven Tubes in a modern Superheterodyne Circuit.

Tubes used are:-

1 - Type 6D6 R.F. Amplifier
1 - " 6A7 Oscillator and 1st Detector
2 - " 6D6 I.F. Amplifier
1 - " 6B7 Diode Detector and Audio Amplifier
1 - " 42 Power Amplifier
1 - " 80 Power Supply Rectifier.

SENSITIVITY:- A tuned radio frequency stage is used on all three Bands, providing maximum useful sensitivity under almost any conditions of aerial effectiveness, and a second untuned intermediate frequency amplifier is used, providing additional amplification, which is of particular use on short wave signals.

To offset somewhat the rather high receiver noises produced with such a large amount of amplification, the total amount of audio frequency amplification available is not utilised. Actually only 1/6th of the signal present in the diode load is coupled to the audio amplifier.

This arrangement permits the use of higher signal amplification than would normally be possible, and still retains a reasonably low receiver noise level. The intermediate frequency used is 465 K.C.

This high intermediate frequency permits definitely one spot tuning on short wave signals, even with carriers of abnormal intensity. Greater sensitivity than has previously been possible is now available on the short wave ranges, by the introduction of controlled reaction in the radio frequency stage.

This controlled reaction condition is obtained by utilising a small common coupling inductance between the R.F. and interstage Coils, made up in the form of a length of the Chassis. Under certain conditions it may be found that with the aerial disconnected, oscillation may take place on the upper part of the short wave band. This is generally

caused by particularly good Tubes, and in no way should it interefere with the satisfactory operation of the Receiver, when connected to an out-door aerial.

Actually such a condition is desirable, as it permits of the greatest amount of useful reaction to be obtained under normal receiving conditions.

ALIGNMENT:- For purposes of alignment, if required in service, the following procedure should be adopted. The intermediate frequency amplifier should be aligned in the usual way - the peaking of all screws at the test frequency, namely 465 K.C. The dial pointer should always be set at 1500 K.C. with the condenser plates in the fully open position. The broadcast section should, in all cases, be treated first. First adjustment should be at 1400 K.C. Condensers C.4., C.7., and C.10 are the broadcast frequency condensers, C.10 being the Oscillator Trimming Condenser.

After alignment is completed at 1400 K.C., the Padding Condenser - P.C.1 - should be adjusted for maximum signals at 600 K.C. The most satisfactory way of doing this is to tune the Receiver to a point near 600 K.C., without receiving a carrier wave, and adjust the Padding Condenser until back-ground noises are at a maximum. If the Padding Condenser has been moved a fair amount in this operation, it is desirable to recheck the high frequency adjustment of the Oscillator Circuit.

Rarely is it found necessary to make adjustments to the high frequency Trimming Condensers, but generally it is found that adjustments to the Padding Condenser are necessary, more particularly when the Receiver has just been unpacked, or when it has been subjected to extremes in temperature.

The Broadcast Frequency Padding Condenser, which is found on the top right hand corner of the Chassis on this particular Receiver, is of such a comparatively small capacity that any fair vibration or temperature change, as stated above, can produce a very large capacity change, with consequent misalignment of the low frequency end of the Receiver.

SHORT WAVE ADJUSTMENTS:- The low frequency short wave band should be treated first. A high frequency test signal of approximately 6 megacycles should be used, and Condensers C.3, C.6 and C.9 adjusted for maximum response. C.9 is the Oscillator Trimming Condenser.

The Padding Condenser, P.C.2., should be adjusted at or about 2.5 megacycles, preferably using Receiver noises for locating the correct position.

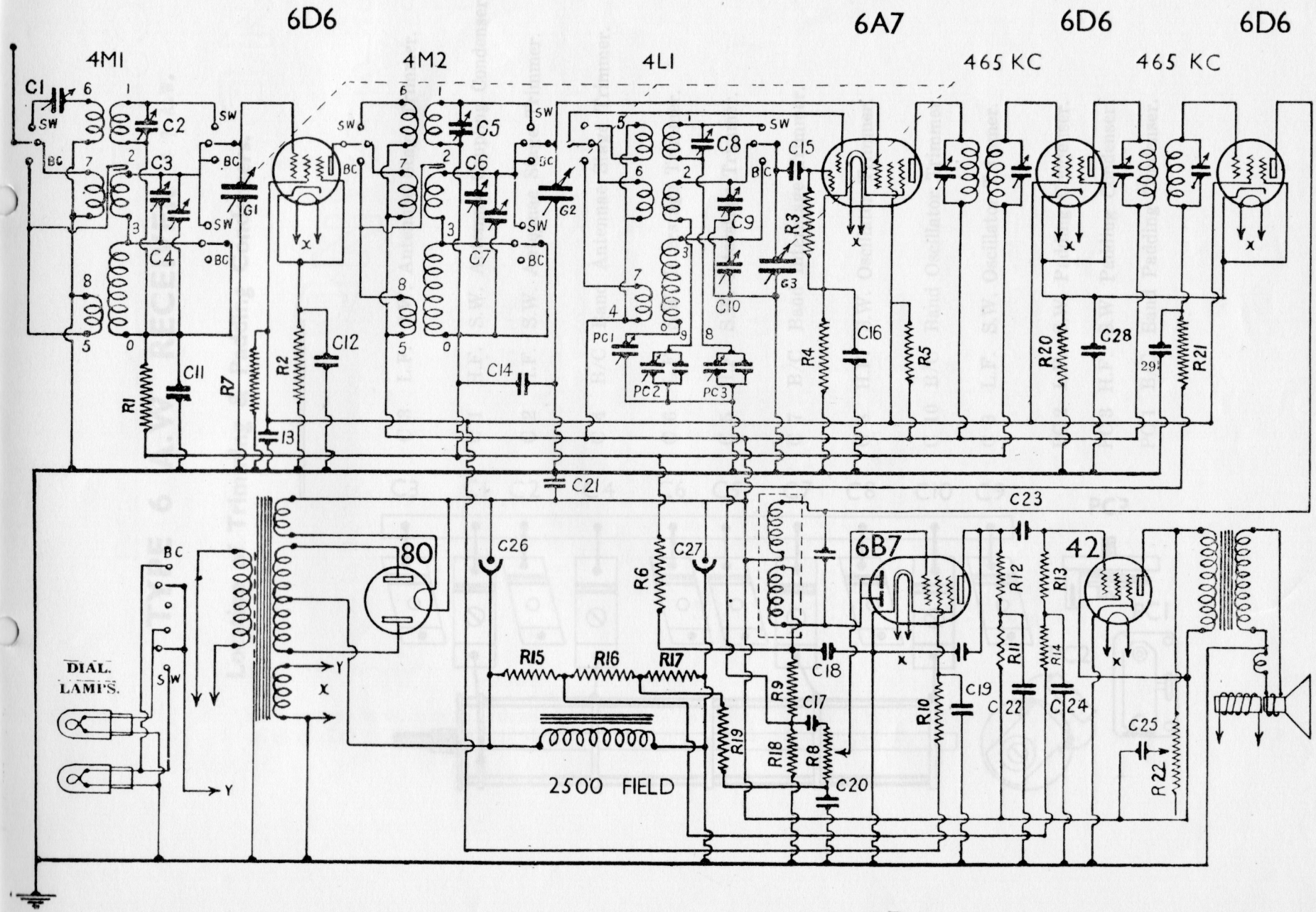
H.F. S.W. band adjustments, should be carried out in a like manner, using C.2, C.5 and C.8 as the high frequency alignment screws - C.8 being the Oscillator Trimmer. A test frequency of 15 megacycles should be used. The Padding Condenser P.C.3 should be aligned at 6 megacycles.

Rarely will it be found necessary to alter the adjustment of these Condensers, and if the Receiver is functioning satisfactorily, adjustments should not be attempted.

Circuit and Component details are shown on separate sheets.

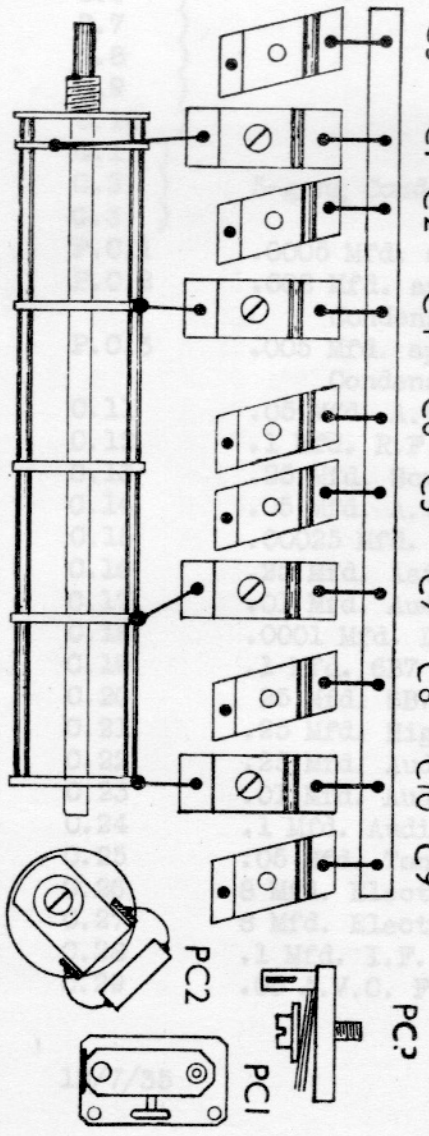
COLLIER & BEALE LIMITED,
66 GHUZNEE STREET,
WELLINGTON, C.2.
12th July, 1935.

7AW RECEIVER



TYPE 6 A.W. RECEIVER & 7 A.W.

Location of Trimming & Padding Condensers.



C 3 L.F. S.W. Antennae Stage Trimmer.

C 1 H.F. S.W. Antennae Coupling Condenser.

C 2 H.F. S.W. Antennae Stage Trimmer.

C 4 B/C Band Antennae Stage Trimmer.

C 6 L.F. S.W. Interstage Trimmer.

C 5 H.F. S.W. Interstage Trimmer.

C 7 B/C Band Interstage Trimmer.

C 8 H.F. S.W. Oscillator Trimmer.

C 10 B/C Band Oscillator Trimmer.

C 9 L.F. S.W. Oscillator Trimmer.

PC 2 L.F. S.W. Padding Condenser.

PC 3 H.F. S.W. Padding Condenser.

PC 1 B/C Band Padding Condenser.

"RADION" GLOUCESTER 7-VALVE A.W. RECEIVER, CONDENSER CAPACITIES.

C.1	30 to 50 Mmf. Trimmers
C.2	
C.3	
C.4	
C.5	
C.6	
C.7	
C.8	
C.9	
C.10	
G.1	3-gang Condenser, .00045 Mfd.
G.2	
G.3	
P.C.1	.0005 Mfd. approx., Broadcast frequency Padding Condenser
P.C.2	.002 Mfd. approx., low frequency short wave Padding Condenser.
P.C.3	.005 Mfd. approx., High frequency short wave Padding Condenser.
C.11	.05 Mfd. A.V.C. Filter
C.12	.1 Mfd. R.F. Bias By-Pass
C.13	.25 Mfd. Screen By-Pass
C.14	.05 Mfd. A.V.C. Filter
C.15	.00025 Mfd. Oscillator Grid Condenser
C.16	.25 Mfd. 1st Detector and I.F. By-Pass
C.17	.01 Mfd. Audio Coupling Condenser
C.18	.0001 Mfd. Diode Load By-Pass
C.19	.1 Mfd. 6B7 Screen By-Pass
C.20	25 Mfd. 6B7 Bias Filter
C.21	.25 Mfd. High Tension By-Pass
C.22	.25 Mfd. Audio Plate Filter
C.23	.01 Mfd. Audio Coupling Condenser
C.24	.1 Mfd. Audio Grid Filter
C.25	.05 Mfd. Tone Control
C.26	8 Mfd. Electrolytic Condenser, insulated
C.27	8 Mfd. Electrolytic Condenser, earthed.
C.28	.1 Mfd. I.F. By-Pass
C.29	.05 A.V.C. Filter.

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"RADION" GLOUCESTER 7-VALVE A.W. RECEIVER.
RESISTOR DETAILS.

R.1	.5 Megohm A.V.C. Filter
R.2	600 Ohm. R.F. Bias
R.3	75,000 Ohm. Oscillator Grid Leak
R.4	150 Ohm. 1st Detector
R.5	15,000 Ohm. Screen Dropping
R.6	1 Megohm A.V.C. Filter
R.7	15,000 Ohm. Screen bleeder
R.8	500,000 Ohm. Volume Control
R.9	.5 Megohm section Diode Load Resistance
R.10	1 Megohm 6B7 Screen dropping
R.11	.1 Megohm 6B7 Audio Plate Filter
R.12	.25 Megohm 6B7 Plate Load
R.13	1 Megohm Grid Leak
R.14	.5 Megohm Audio Grid Filter
R.15	.5 Megohm)
R.16	75,000 Ohm. } Bias Potentiometer
R.17	10,000 Ohm.)
R.18	.1 Meg. Section Diode Load
R.19	.5 Meg. 6C7 Bias Filter
R.20	1200 Ohm. I.F. Bias
R.21	.1 Meg. A.V.C. Filter
R.22	Tone Control.

12/7/35.