

1940

# TECHNICAL INFORMATION

BULLETIN NO. 144

(TYPE)

MODEL 516 H.M.V. 5-VALVE BROADCAST RECEIVER.

RECEIVER

COLLIER & BEALE LTD.

WELLINGTON

TECHNICAL DESCRIPTION AND ADJUSTMENT PROCEDURE

OF 5-VALVE BROADCAST RECEIVER.

MODEL 516.

Model 516 receiver is of the Superheterodyne type and employs a total of 5 valves used in the following arrangement :-

- 1 - type 6AS-G Mixer oscillator
- 1 - " 6K7-G Intermediate frequency amplifier (465-Kc/s.)
- 1 - " 6Q7-G Diode rectifier and 1st audio amplifier
- 1 - " 6P6-G Power amplifier
- 1 - " 5Y3 Power supply rectifier

The circuit embodied in this receiver is conventional in all respects and adjustment if ever required should be undertaken along conventional lines and the following procedure is recommended. Refer also drawings Nos. 704 and 705 attached.

Intermediate Frequency Amplifier Alignment. The intermediate frequency used in model 516 is 465 Kc/s., both transformers being adjusted for maximum output and under no circumstances should a "staggered" adjustment be used as the "gain" of the whole receiver will be materially affected. Adjustment of the two (2) transformers should be undertaken by first aligning the diode transformer alone, this being accomplished by clipping the signal generator lead on to the grid of the intermediate frequency amplifier tube (6K7-G) and adjusting for maximum output. The generator unit should then be transferred to the grid of the mixer tube (6AS-G) and the first transformer treated in a similar manner. In this latter adjustment, to avoid any possibility of loss in the detector input circuit, it is desirable to entirely remove the grid lead from the detector valve and to complete the grid circuit temporarily with a fixed resistor of approximately 50,000-ohms resistance.

Signal Frequency Circuits Alignment. Adjustment of the signal frequency circuits, although not difficult, should be undertaken with a fair amount of care, particularly in the setting of the oscillator trimmer condenser, and, in no case, unless the performance of the receiver is in question, should any attempt be made to disturb the factory adjustments, regardless of minor errors in dial readings. The order of adjustment is as follows.

With an accurate signal generator set at some convenient high frequency, say 1,500-Kc/s. or 1,600 Kc/s., and with the gang condenser set at the correct position as indicated by the dial scale, the oscillator trimmer should be adjusted for maximum output. With this adjustment made, both the mixer and R.F. trimmers may then be adjusted. Neither of these two latter adjustments is critical nor difficult to perform and very rarely, unless the receiver has been tampered with, will any major variation be required to be made.

With these adjustments satisfactorily made, the receiver should be aligned or "padded" at the low frequency end of the band, this adjustment taking place at approximately 600-Kc/s. The most satisfactory way of adjusting the padding condenser is to use a highly damped signal source, rather than the signal generator, to avoid the necessity of constantly "rocking" the tuning mechanism to ensure the optimum adjustment that provides maximum output. The most suitable

highly damped source is generally available in the variety of electrical disturbances that constitute the usual background of a radio receiver when connected to an antenna. The receiver, therefore, should preferably be tuned to a frequency of 600-Kc/s., making sure that no station carrier wave is present, and the padding condenser adjusted for maximum noise output. After satisfactory adjustment of the padding condenser, it is wise again to re-check the high frequency oscillator trimmer condenser, this latter adjustment only being necessitated if a considerable movement of the padding condenser has taken place.

As an aid in servicing the receiver in the event of failure in any of the components fitted, a component schedule is appended which is to be used in conjunction with the schematic diagram attached.

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COLLIER & BEALE LIMITED,  
66 GHUZNEE STREET,  
WELLINGTON, C.2.  
7th October, 1940.

COMPONENT SCHEDULE FOR MODEL 516

BROADCAST RECEIVER.

CONDENSERS:

C-1	8-mfd.	}	Power supply filter condensers
2	8 "		H.T. R.F. by-pass.
3	.25 "		Screen R.F. by-pass
4	.1 "		Cathode R.F. by-pass
5	.25 "		Oscillator grid.
6	.0001 "		A.V.C. by-pass
7	.05 "		Audio coupling
8	.01 "		" "
9	.01 "		A.F. Bias filter
10	.1 "		Audio filter
11	.004 "		Tone control
12	.00025 "		R.F. plate filter
13	.0001 "		Padding condenser.
14	550-mmfid.		Diode load by-pass
15	.0001-mfd.		

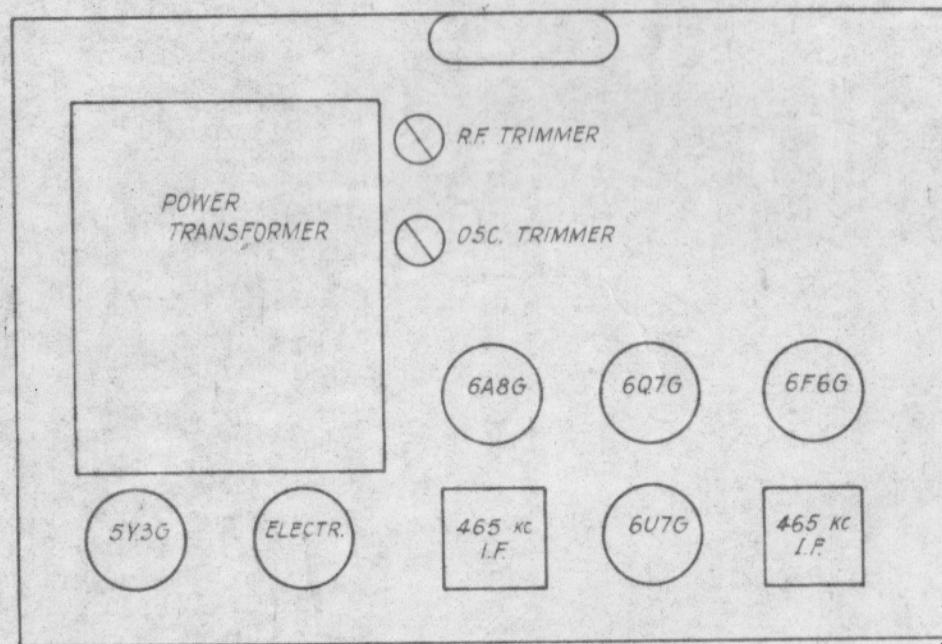
RESISTORS:

R-1	400-ohm	Bias resistor, output stage.
2	10,000 "	Screen dropper
3	50,000 "	Oscillator grid leak
4	1-meg.	A.V.C. filter
5	200-ohm.	Cathode bias
6	10-meg.	Grid leak
7	.5-meg.	Volume control
8	.5 "	Tone control
9	.25 "	Plate load
10	50,000-ohm.	Audio bias filter
11	10,000 "	Antenna coil shunt.

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# CHASSIS LAYOUT ~ H.M.V. MODEL 5/6



AMENDED CIRCUIT FOR MODEL 516A  
USING TYPE 6SA7 CONVERTER  
(APPLIES TO SERIAL N<sup>o</sup> 57301 ONWARDS)

