TECHNICAL INFORMATION

BULLETIN No. 102. 30th May 1935

(TYPE)

9 L.S. RECEIVER - SERIES 1. 29 May 1935

9-valve DW

RECEIVER

COLLIER & BEALE LTD.

WELLINGTON

9LS

TECHNICAL DATA

OF THE NEW SERIES

TYPE "9LS" RECEIVER.

This Receiver uses 9 Tubes in the following arrangement:-

1	-	Type 6D6 Signal frequency amplifier
1	-	" 6A7 Oscillator and 1st detector
1	-	" 6D6 I.F.amplifier
1	-	" 6B7 Diode detector and audio amplifier
1	-	" 42 audio driver
2	-	" 42 operating class "AB", as power amplifier
1	-	" 83V. receiver section power supply
1	-	" 83V. power amplifier power supply

This is a high fidelity Receiver, and incorporates a variable band width I.F. amplifier, arranged to give a broad or a sharp I.F. characteristic, as desired. In the broad position, frequencies as high as 10,000 cycles can be reproduced without very great losses. This is considerably higher than most Broadcast stations can transmit, due to the general 10 K.C. channels permitting only a flat maximum of 5,000 cycles. This moderately wide band can be reduced for maximum selectivity in distant reception, to an order that will permit closer than 10 K.C. separation, and is sufficient to permit of reception of any Broadcast station that can be heard in New Zealand, regardless of the proximity of other stations of 10 K.C. or less separation.

A high quality Audio Output stage is used, which, with the Tubes operating under Class "AB" conditions, provides at least 12 Watts of undistorted power, which with the effecient reproducer used, provides adequate volume for all normal requirements.

The frequency response of this Output stage and reproducer extends well down to 30 cycles without loss, and provided a high quality transmission is being received, the reproduction is little short of amazing.

POWER SUPPLY:- Two power supplies are used for the express purposes of obtaining the most satisfactory conditions of operation of the Output Tubes in the "AB" connection. One power supply is used to supply the voltage and power requirements of the Receiver section and loud speaker field, and also to provide a fixed bias for the Output Tubes.

This section of the power supply is quite conventional and uses a high resistance field as the sole Choke. Bias for the driver and power stage is obtained from a portion of the voltage drop in the Speaker field.

The second power supply, which uses an identical Transformer, is filtered by a single choke and two Electrolytic Condensers, and is applied directly to the power stage. Under these conditions, a maximum voltage of approximately 400 is applied to the power stage, which, under conditions of maximum Output, varies somewhat, but due to the isolation of the bias supply which does not vary, has little or no effect on the reproduction.

To maintain the power amplifier bias supply constant under the conditions of varying grid current, a large capacity condenser is used, made up in the form of 2 - 25 Mfd. Electrolytic Condensers, in series; the bias voltage being of the order of 45 Volts.

By the use of the new Type 83V Rectifying Tubes, the efficiency of both power supplies is greatly improved, permitting a much higher voltage available, and further, eliminates any possibility of condenser break-down, as the cathode in these tubes heats at the same rate as the rest of the tubes in the Receiver.

SENSITIVITY:- A tuned radio frequency stage is used on both Broadcast and Short Wave ranges, providing maximum useful sensitivity under almost any conditions of aerial effectiveness. 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 range 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 interfere with the satisfactory operation of the Receiver when connected to an Outdoor 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:- The alignment of this Receiver is generally similar to our last year's Receiver, and others of a similar type. In all cases the Broadcast section should be treated first. Gang Condenser adjustments should be undertaken at 1400 K.C. and at 600 K.C.

Rarely, however, is it necessary to make any adjustment to the Gang Condenser Trimmers, but generally it is found that adjustments to the Broadcast 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 Padding Condenser, which is found to the left of the Gang Condenser, is of such a comparatively small capacity that any fair vibration or temperature change may produce a very large capacity change, with consequent mis-alignment of the low frequency end of the Receiver.

SHORT WAVE ADJUSTMENT:- On this Receiver, all the additional Short Wave Trimming Condensers are found centralised round the Gang Switch. The Short Wave high frequency Trimming Condensers should only be adjusted after the Broadcast frequency adjustments have already been made. High frequency adjustments should be made at or about 15 M.C., whereas the low frequency Padding Condenser should be adjusted at 6 M.C. This is located to the right of the Gang Condenser. Rarely will it be found necessary to make any adjustments to either of these Condensers.

Circuit and Component details are shown on separate sheet.

last Addition shown May 1935

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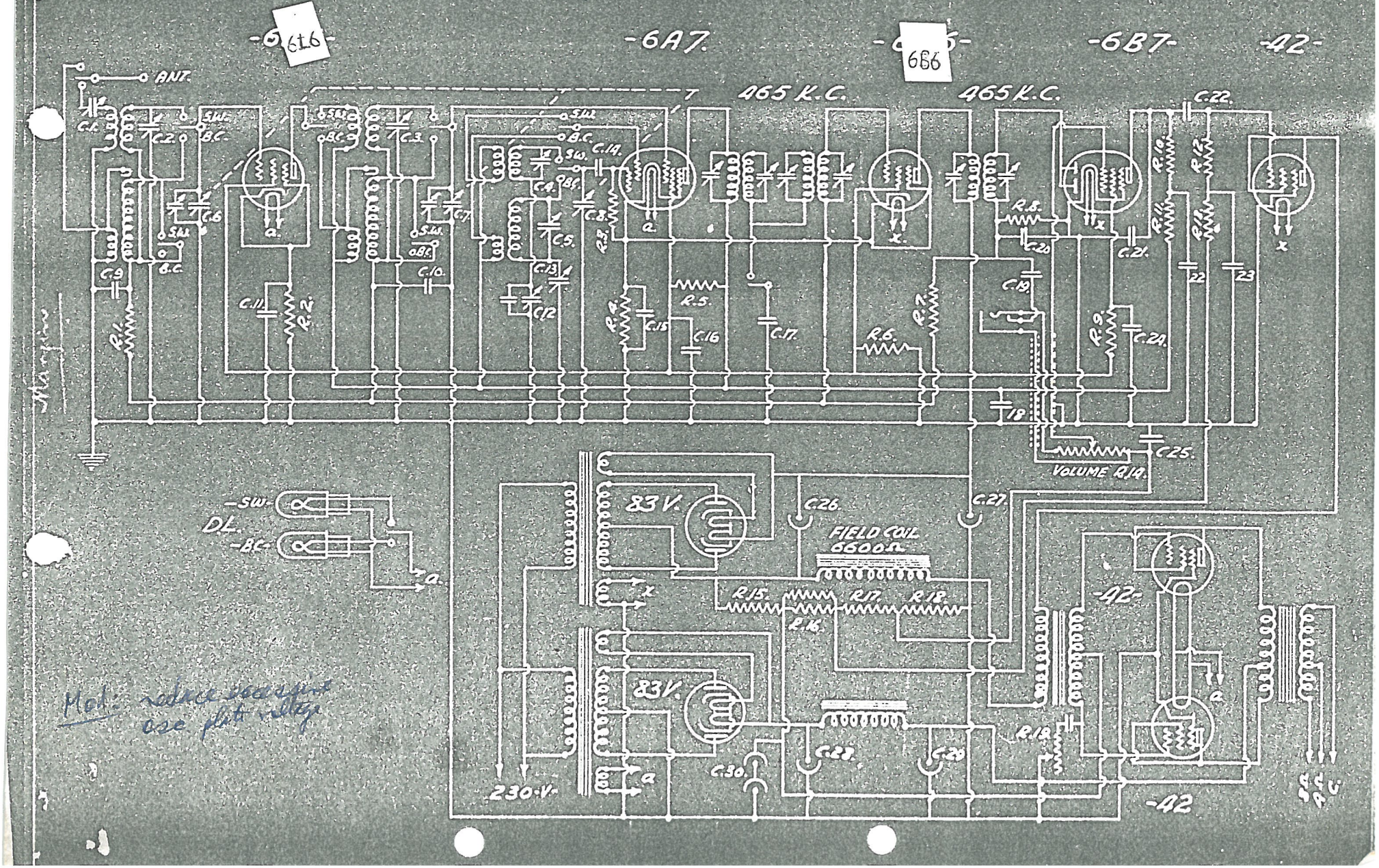

Mod. reduce resistance use plate relay

NO. 9LS. RECEIVER - CONDENSER CAPACITIES.

C.1, C.2, C.3, C.4, C.5	30 to 50 Mmfd. High frequency trimmers
C.6, C.7, C.8	3-Gang Variable Condenser, 450 Mmfd.
C.9, C.10	.05 Mfd. A.V.C. filter
C.11	.1 Mfd. R.F. By-Pass
C.12	Short wave padding condenser, total .005 Mfd.
C.13	Broadcast padding condenser, total 550 Mmfd.
C.14	.00025 Mfd. Oscillator grid condenser
C.15	.25 Mfd. oscillator and I.F. By-Pass
C.16	.25 Mfd. Screen By-Pass
C.17	.01 Mfd. I.F. Expander
C.18	.5 Mfd. High Tension By-Pass
C.19	.01 Mfd. 6B7 audio coupling
C.20	.001 Mfd. diode load By-Pass
C.21	not used
C.22	.25 Mfd. 6B7 audio plate filter
C.23	.1 Mfd. audio grid filter
C.24	.05 Mfd. 6B7 screen By-Pass
C.25	25 Mfd. 6B7 bias filter
C.26, C.27, C.28, C.29	8 Mfd. electrolytic condensers
C.30	2 - 25 Mfd. in series, power stage, bias filter
C.31	.01 Mfd. tone control.

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NO. 9LS. RECEIVER - RESISTORS.

R.1	.5 Megohm A.V.C. bias filter
R.2	600 Ohm. R.F. bias
R.3	75,000 Ohm. Oscillator grid leak
R.4	150 Ohm. 1st Detector and I.F. bias
R.5	15,000 Ohm. Screen dropping
R.6	15,000 Ohm. Screen bleeder
R.7	1 Megohm A.V.C. filter
R.8	.5 Megohm diode load
R.9	1 Megohm 6B7 screen dropping
R.10	.25 Megohm 6B7 plate load
R.11	100,000 Ohm. 6B7 audio plate filter
R.12	1 Megohm grid leak
R.13	.5 Megohm audio grid filter
R.14	500,000 Ohm. volume control
R.15	50,000 Ohm. bias potentiometer
R.16	5,000 " " "
R.17	10,000 " " "
R.18	600 " " "
R.19	500,000 Ohm. tone control

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