

3C89	C19	C10	C27	C90	C11	C17	C14	C13	C8-C10	C96	C93	C24	C21	C7	C23	C3-C5	C107	C92	C1
3C	C28	C94	C108	C103	C16	C15	C12		C105	C26	C25	C6	C20	C22					
7-R29	R58	R68	R13	R19	R18(2)	R20	R22	R6	R65	R66	R24	R25	R23	R5	R1				
R9	R4	R3	R64	R69	R26	R70	R67	R2											
V6	L21	L25	V7	S4	MS.af	L30	S5	MS.br	L28	L27	L26	P2	P1						
MS.cf			FS.wr	L22	V10	V8	L29			V9			MS.ar						

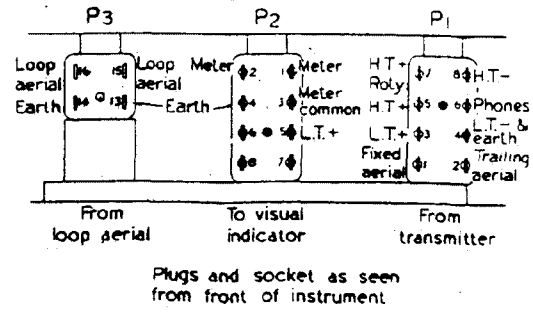
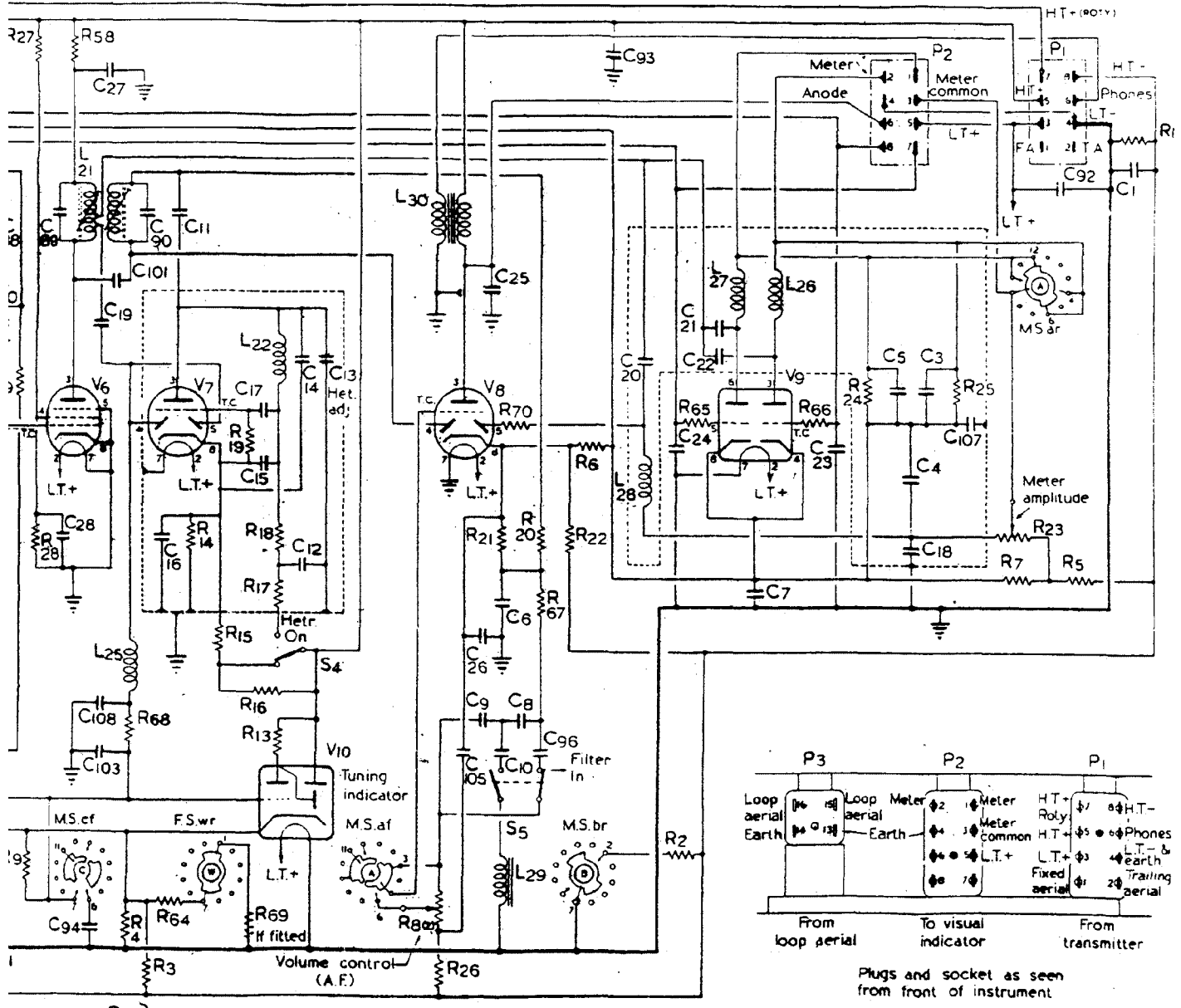


FIG. 4

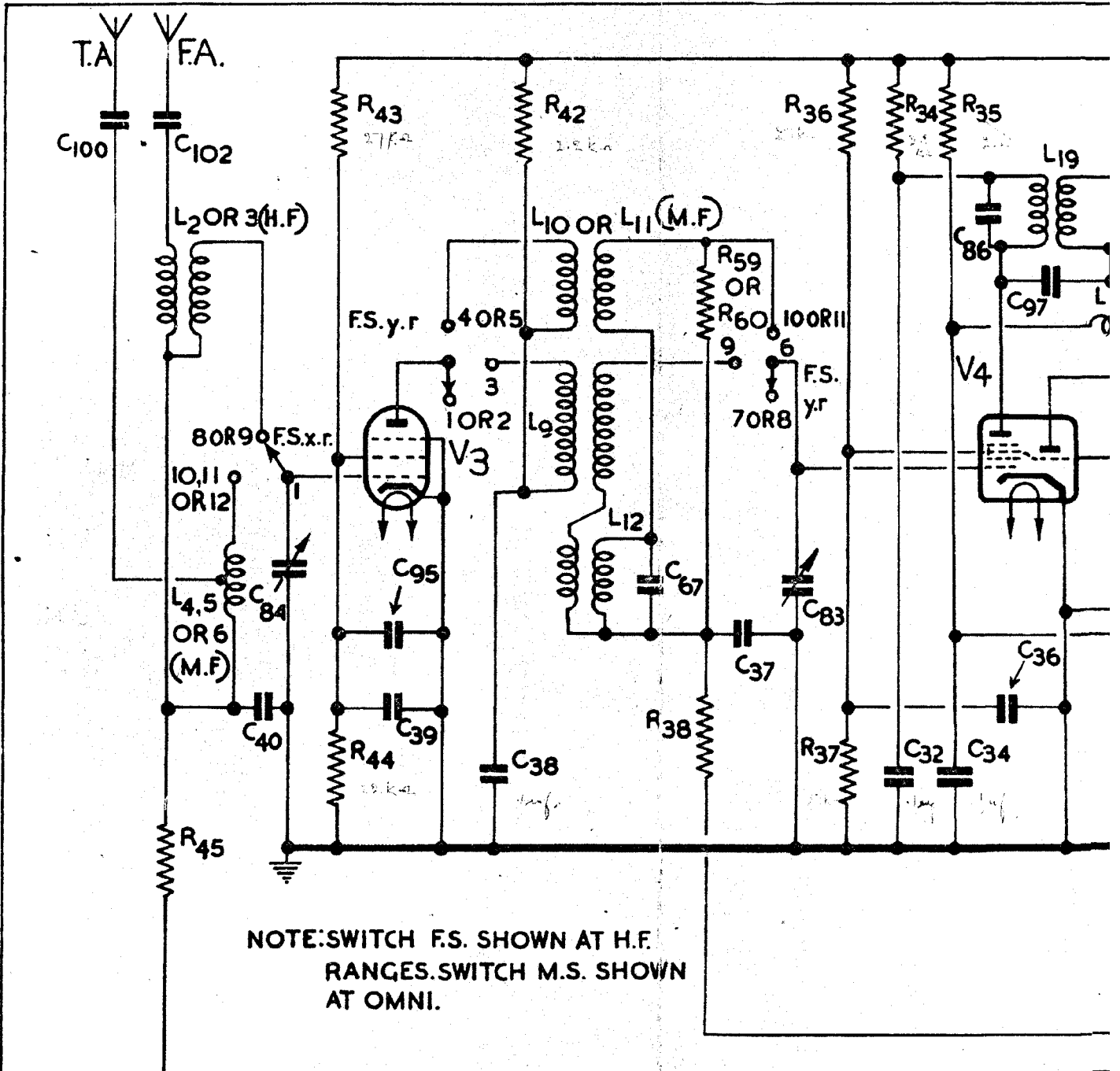
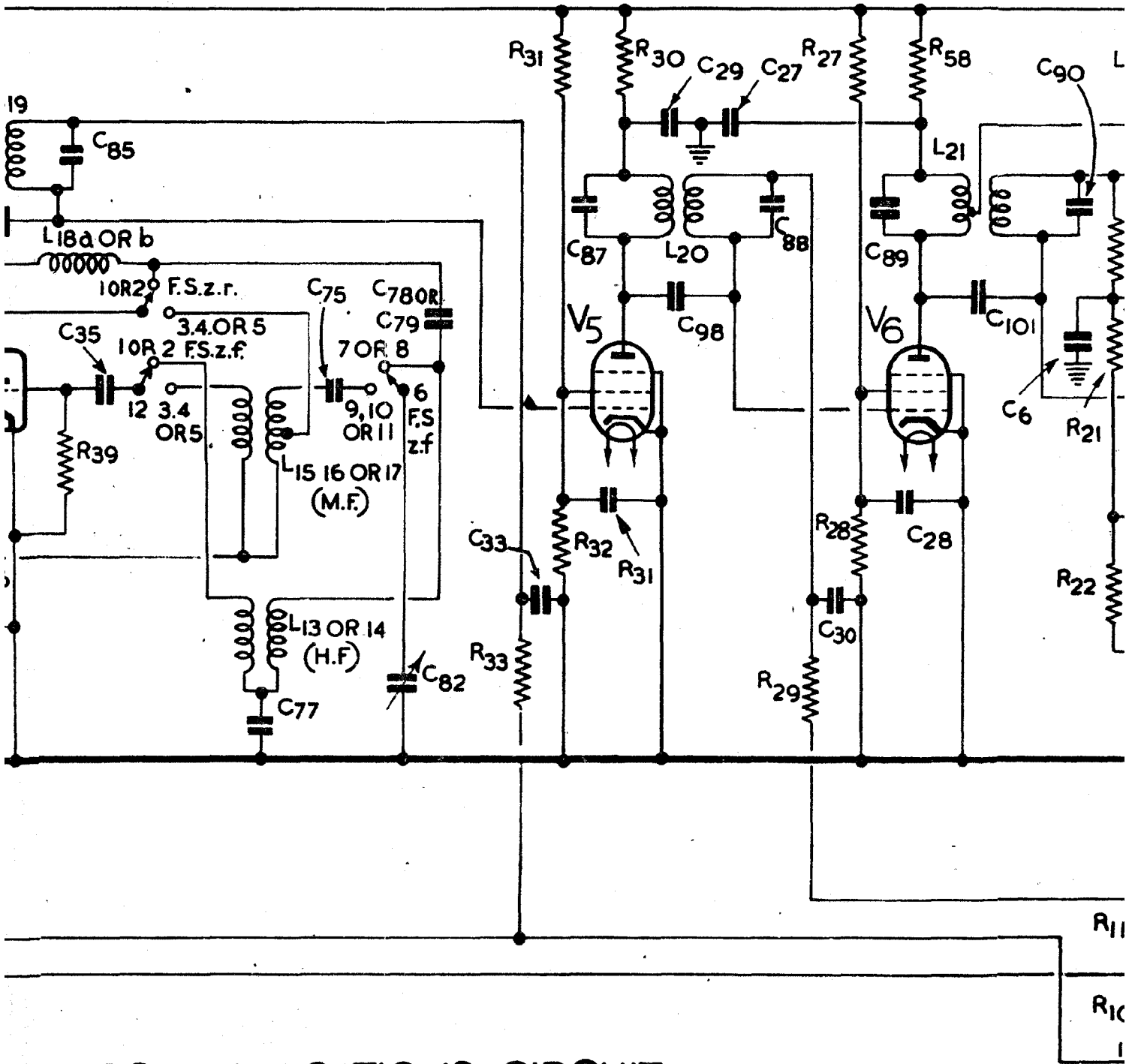


FIG.5

R.1155 SIMPLIFIED



IED COMMUNICATIONS CIRCUIT.

electronically mixed in the hexode portion and voltages at the difference frequency (560 kc/s) are developed across the anode load, which consists of the coil L_{19} and the condenser C_{86} . The screen derives its voltage from the potential divider comprised of R_{36} , R_{37} , and R_1 , with the associated condensers C_{36} and C_1 .

Triode section

15. The triode section of the valve operates as an R.F. oscillator and consists of a tuned anode circuit loosely coupled to an untuned grid circuit. The grid windings of the coils L_{13} , L_{14} , L_{15} , L_{16} , and L_{17} are selected for each range by the switch FS_{2f} . The anode windings of L_{13} to L_{17} are similarly switched into the anode circuit by switch sections FS_{2r} and FS_{2f} . On ranges 3, 4, and 5 the oscillator is series-fed, the anode being connected to a tap on the secondary of the coil L_{15} , L_{16} , or L_{17} . On ranges 1 and 2 the oscillator is parallel-fed through the choke L_{18a} or L_{18b} and coupling condenser C_{79} or C_{79} . L_{18a} and L_{18b} resonate at a frequency just below the lowest frequency in their respective bands. Each tuned circuit is tracked to the signal circuits with pre-set parallel trimming condensers C_{68} to C_{72} , and fixed series padding condensers C_{73} to C_{77} . C_{81} determines the minimum capacitance of C_{82} .

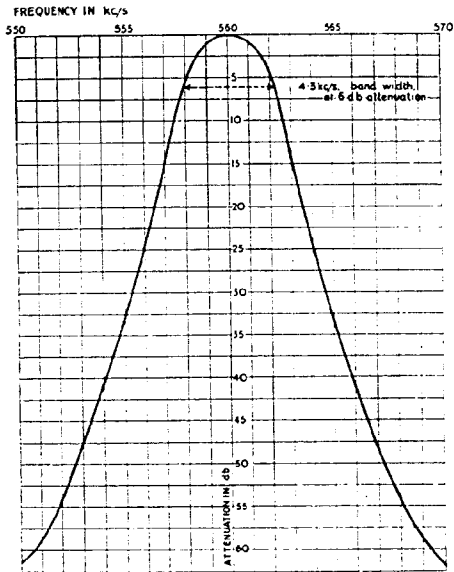


FIG. 6.—I.F. RESPONSE CURVE

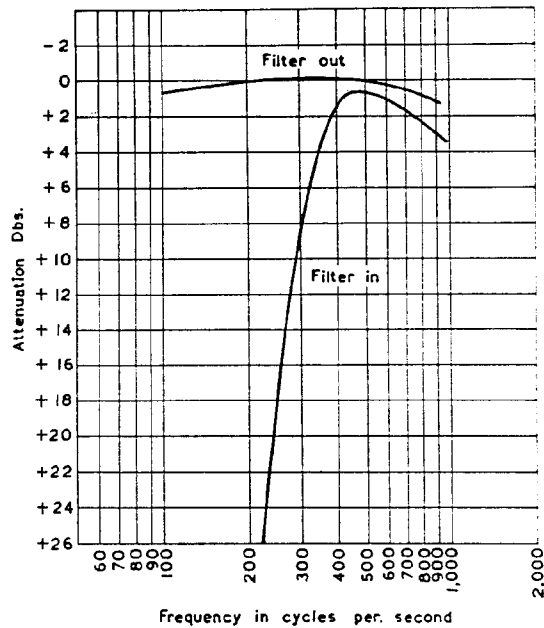


FIG. 7.—A.F. FILTER CHARACTERISTICS

I.F. stages

16. The receiver includes two stages of I.F. amplification employing three band-pass coupling units. The peaked response of this coupling is shown in the curve in fig. 6. Very little inductive coupling exists between the tuned circuits of the band-pass units, the coupling being effected by the small condensers C_{97} , C_{98} , and C_{101} . The coils are adjusted to the I.F. of 560 kc/s by means of iron-dust cores. The primary of the first I.F. transformer, with its associated fixed condenser C_{86} forms the anode load of the hexode portion of the valve V_4 . Decoupling is effected by the resistor R_{34} and condenser C_{32} . The secondary is connected as the grid circuit of V_5 , the resistor R_{33} and condenser C_{33} providing decoupling of the grid bias. The two I.F. valves, V_5 and V_6 , are variable-mu H.F. pentodes, and on A.V.C. their control grids are biased to full and one-tenth A.V.C. voltages respectively. The I.F. transformer units between V_5 and V_6 and between V_6 and V_8 are similar to that already described for the V_4 - V_5 coupling.

Detector and output stages

17. The output from the I.F. amplifier valve V_6 passes to the I.F. transformer unit L_{21} and is taken to one diode of a double-diode-triode valve V_8 . This diode acts as a detector, and the triode section functions as the output valve. The use of a second diode will be dealt with in describing the D.F. circuits (see para. 48). The rectified voltage from the diode detector is developed across two resistors R_{20} and R_{21} . The resistor R_{20} , in conjunction with a condenser C_6 , forms part of a

R.F. filter system to prevent R.F. being passed to the A.F. circuit. A condenser C_{28} with R_{22} decouples the cathode. The A.F. passes through a network comprising the resistor R_{87} and two series condensers C_8 and C_9 to a potentiometer $R_{8(2)}$, the moving contact of which is connected to the grid of the valve V_8 . The voltage developed across $R_{8(2)}$ is admitted at the grid of V_8 , the anode load of which is the primary of the output transformer L_{30} , by-passed by a condenser C_{25} and connected direct to the H.T. positive input pin 5 of plug P_1 .

18. Before the potentiometer $R_{8(2)}$ there is an A.F. filter network composed of the condenser C_{10} , and an A.F. choke coil L_{29} . The A.F. filter network, which may be switched in or out of circuit by the switch S_5 , prevents the greater proportion of the frequencies below 300 c/s from reaching the volume control $R_{8(2)}$ and the output stage. The filter removes part of the noises due to the aircraft electrical and ignition systems. The A.F. filter characteristics are given in fig. 7 and the input/output characteristics in fig. 9.

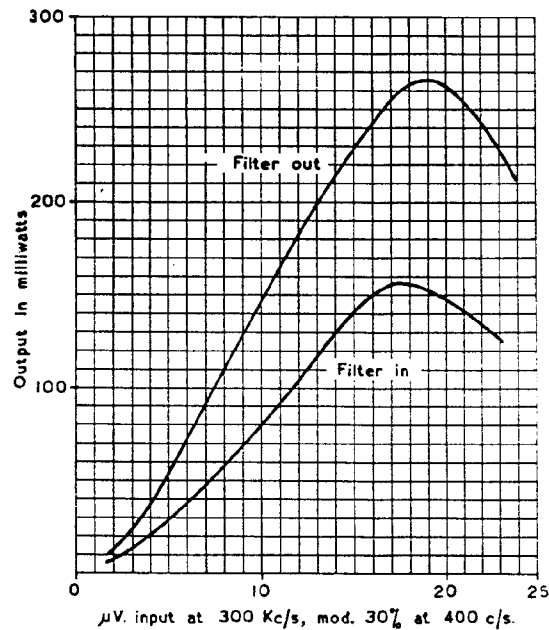


FIG. 9.—INPUT/OUTPUT CHARACTERISTICS

Manual volume control

19. Manual control of the gain of the R.F. and I.F. valves V_3 , V_4 , V_5 , and V_6 is effected by the application of varying degrees of grid bias to their respective grids by the potentiometer $R_{8(1)}$. When the master switch MS is in the *OMNI* position the grid of the output valve V_8 is joined through the section MS_{af} to the top end, that is, further from the H.T. negative, of the A.F. volume control $R_{8(2)}$ and the variable slider is out of circuit. The full A.F. voltage is therefore applied to the grid of V_8 . The automatic volume control (A.V.C.) system is inoperative.

20. With the switch at *OMNI* the circuits are:—

- (i) A fixed potentiometer, consisting of the resistors R_{10} , R_{11} , and R_{12} , is connected, through the switch contacts MS_{af} , to the slider of the manual R.F. gain control $R_{8(1)}$.
- (ii) The A.V.C. diodes of V_7 (strapped together) are connected, through the load resistor R_9 , to a point 3.6 volts negative along the resistors R_3 and R_4 , the rectified voltage across R_9 operating the tuning indicator V_{10} .
- (iii) On ranges 1 and 2 the switch FS_{wr} connects R_{64} , (and R_{69} if fitted) across R_4 to reduce the minimum bias voltage and also the delay on the operating voltage of the indicator V_{10} .

21. The chassis is approximately 30 volts positive with respect to H.T. negative. The method by which this figure and that of the 3.6 volts negative, previously mentioned, are assessed may be understood from fig. 8. The effective resistance of the potentiometer networks across the supply, having regard to the switch positions, gives a basis for calculation. (Effective resistance should not be confused with the values given in the list of components.) The resistor R_1 has, at a minimum, $R_3 + R_4$ in parallel with it and these form a potential divider so that 26.4 volts are across R_3 and 3.6