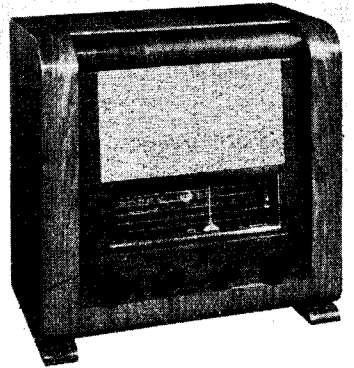


G.E.C. 3910 ALL-WAVE SUPER TEN



A new season's model, the BC3910, is a 10-valve dual speaker five-band A.C. superhet.

CIRCUIT.—The aerial input circuits to the grid of V1, a pentode H.F. amplifier, consist of transformers for two short bands, an auto-transformer arrangement for the B3 short wave band and single tuned circuits for the medium and long wave bands. The aerial input is shunted by a resistance R1.

V1 is coupled to V2 by H.F. transformers with tuned secondaries. Extra coupling is provided by C4 on the medium waves. The oscillator section of the triode hexode frequency changer V2 follows standard practice.

An I.F. transformer, tuned to 456 kc., couples V2 to the pentode I.F. amplifier, V3. The primary and secondary windings are shunted by resistances and on "gram" the primary of the transformer is shorted. A further I.F. transformer couples V3 to the second I.F. amplifier, V4.

V1, V2, V3 and V4 are A.V.C. controlled. The cathodes of V3 and V4 are returned to chassis via a common variable resistance, R49, which forms a sensitivity control.

A third I.F. transformer provides the coupling between the second I.F. amplifier, V4, and the demodulating diode of V5, a double diode triode. The other diode operates the A.V.C. network. The coupling arrangements to the grid of the triode section include a manual volume control, and from this circuit is fed the visual tuning indicator.

V5 is resistance capacity coupled to V6, another pentode, connected to work as a triode phase reverser. This feeds the two

output tetrodes, V7 and V8, operating in push pull.

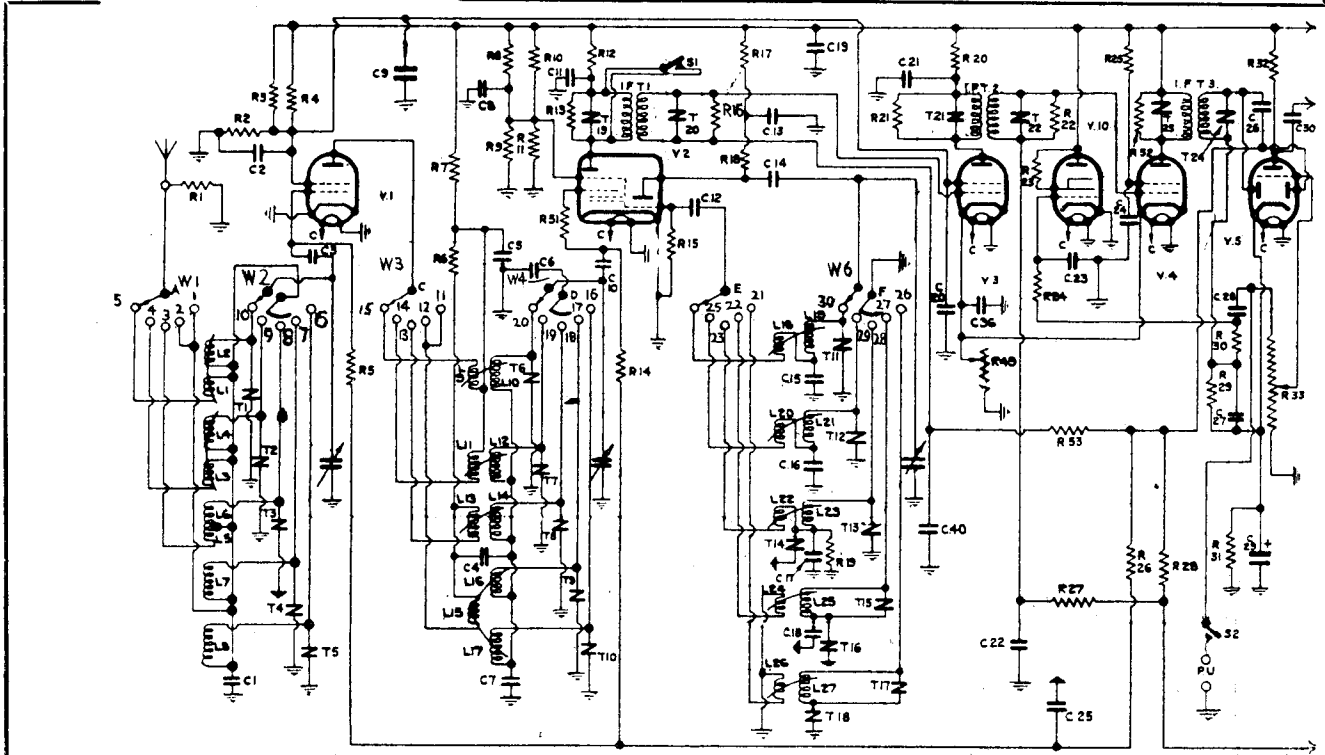
Mains equipment consists of a mains transformer, a full-wave rectifying valve V9, electrolytic smoothing condensers and smoothing chokes. Extra smoothing for the main H.T. circuit is obtained by C37 and a second smoothing choke (choke 2).

Chassis Removal.—The cabinet has a false bottom. To take out the chassis:—

Remove the mains plug, the back of the cabinet, the six spring-fixed control knobs, and the four chassis-securing bolts. The chassis is then free to the extent of the

CONDENSERS

C.	Purpose.	Mfds.	C.	Purpose.	Mfds.
1	Input circuit padder . . . . .	.003	22	V4 A.V.C. decoupling . . . . .	.1
2	V1 screen decoupling . . . . .	.05	23	T.L. grid decoupling . . . . .	.05
3	V1 grid isolator . . . . .	.0005	24	V4 screen decoupling . . . . .	.1
4	M.W. & L.W. prim. shunt . . . . .	.0005	25	A.V.C. line decoupling . . . . .	.05
5	V1 anode decoupling . . . . .	.1	26	A.V.C. diode coupling . . . . .	.0001
6	B2 shorting condenser . . . . .	.02	27	H.F. bypass . . . . .	.0001
7	H.F. fixed padder . . . . .	.0032	28	L.F. coupling . . . . .	.01
8	V2 screen decoupling . . . . .	.05	29	V5 cathode bias shunt	35
9	V1 and V2 screen decoupling	1	30	L.F. coupling . . . . .	.02
10	V2 grid decoupling . . . . .	.0005	31	L.F. coupling . . . . .	.003
11	V2 anode decoupling . . . . .	.05	32	Tone control . . . . .	.005'
12	Osc. grid . . . . .	.0005	33	V7 cathode bias shunt	35
13	Osc. anode decoupling . . . . .	.1	34	L.F. coupling . . . . .	.02
14	Osc. anode coupling . . . . .	.0001	35	V7 cathode bias shunt	35
15	B1 fixed padder . . . . .	.00182	36	V3 and V4 cathodes bias shunt . . . . .	.25
16	B2 fixed padder . . . . .	.00156	37	H.T. smoothing	7
17	B3 fixed padder . . . . .	.0005	38	H.T. smoothing	14
18	M.W. fixed padder . . . . .	.0002	39	H.T. smoothing	7
19	H.T. line bypass . . . . .	.1	40	V3 A.V.C. decoupling . . . . .	.02
20	V3 screen decoupling . . . . .	.05	41	H.T. smoothing	7
21	V3 anode decoupling . . . . .	.05			



speaker-cable and can be operated outside the cabinet.

Connections to the two speakers are made by a non-reversible five-pin plug, removal of which enables the chassis to be freed from the speakers.

Special Notes.—Sockets at the rear enable a pick-up to be connected. The selectivity control on the front cuts off radio input when working on gram.

Sockets also enable an extension speaker of some two to four ohms impedance to be connected. The special plug provided gives control of the internal speakers.

The mains adjustment device is located on a panel on the top of the mains transformer and enables voltages of between 100-150 and 200-250 volts to be applied.

Two pins at the back, engaging with a

two socket member that must be removed before the back can be detached, form a safety device.

The four dial lamps are rated at 6.5 volts .3 amp., have M.E.S. bases and are Osram type "S."

The visual tuning indicator can be detached by removing two wing nuts. The bracket is slotted to allow the indicator to be rotated to its correct position. The T.L. anode feed resistance, R23, is connected across its valve holder.

Alignment Notes

I.F. Circuits.—Connect an output meter across the primary of the output transformer, i.e., across the anodes of V7 and

G.E.C. All-wave Super 10

MODEL BC.3910, Fidelity All-Wave Super 10.—For A.C. mains, 100-150 and 200-250 volts, 40-100 cycles. Price 29 gns.

DESCRIPTION.—Eight-valve, plus rectifier, five-band table model superhet.

FEATURES.—Full-vision scale, calibrated in metres and station names (S.W. also in megacycles), coloured as to waveband. Dual speakers. Three short wave bands. Controls for tuning, combined sensitivity and gram-radio control, separate bass and treble controls, and combined volume and master switch. Separate vernier scale for accurate calibration of S.W. bands. Wave selection, sensitivity and gram-radio controls operate indicators. Visual tuning indicator. Sockets for pick-up and extension speaker with control of internal speakers.

LOADING.—160 watts.

Sensitivity and Selectivity

SHORT WAVES (11-25 metres, 25-75 metres, 75-200 metres).—Excellent gain and selectivity, well maintained over all three bands. Tuning very easy and no noticeable drift.

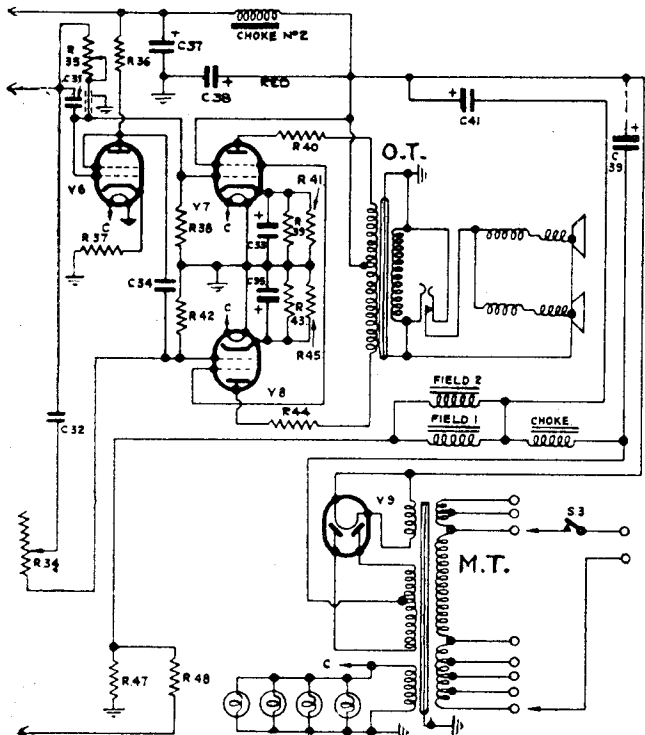
MEDIUM WAVES (200-550 metres).—Excellent performance as regards both sensitivity and selectivity. Evenly maintained gain and a good background.

LONG WAVES (900-2,100 metres).—All main stations easily received with very little trace of interference on Deutschlandsender.

Acoustic Output

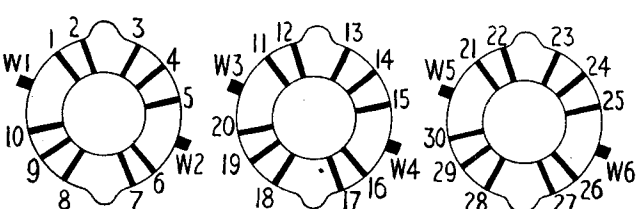
Ample volume for a large room. Adjustment of separate treble and bass controls gives pleasing reproduction with exceedingly natural speech. Orchestral and vocal music reproduces excellently with very little colouration. The acoustic performance is definitely above average.

RESISTANCES					
R.	Purpose.	Ohms.	R.	Purpose.	Ohms.
1	Aerial shunt	9,900	27	V4 A.V.C. decoupling	440,000
2	V1 and V3 screens ptr. (part)	33,000	28	A.V.C. diode load (part)	220,000
3	V1 and V3 screens ptr. (part)	55,000	29	Demodulating diode load	220,000
4	V1 and V3 screens ptr. (part)	55,000	30	H.F. stopper	99,000
5	V1 A.V.C. decoupling	440,000	31	V5 cathode bias	3,300
6	V1 anode feed	9,900	32	V5 anode load	99,000
7	V1 anode decoupling	2,200	33	Volume control	1 meg.
8	V2 screen ptr. (part)	22,000	34	Tone control	1 meg.
9	V2 screen ptr. (part)	22,000	35	Tone control	1 meg.
10	V2 screen ptr. (part)	22,000	36	V6 anode load	99,000
11	V2 anode decoupling	22,000	37	V6 cathode bias	33,000
12	V2 anode decoupling	2,200	38	V7 grid leak	440,000
13	I.F.T.1 prim. shunt	22,000	39	V7 cathode bias (part)	400
14	V2 A.V.C. decoupling	440,000	40	V7 anode stabiliser	100
15	Osc. grid leak	55,000	41	V7 cathode bias (part)	400
16	I.F.T.1 sec. shunt	220,000	42	V8 grid leak	440,000
17	Osc. anode decoupling	9,900	43	V8 cathode bias (part)	400
18	Osc. anode load	22,000	44	V8 anode stabiliser	100
19	B3 regeneration modifier	2,200	45	V8 cathode bias (part)	400
20	V3 anode decoupling	2,200	46	A.V.C. delay loads	15
21	I.F.T.2 primary shunt	77,000	48	A.V.C. diode load (part)	99,000
22	I.F.T.2 sec. shunt	77,000	49	Selectivity control	1,300
23	T.L. anode feed	1 meg.	51	V2 grid stopper	50
24	T.L. grid decoupling	2 meg.	52	I.F.T.3 primary shunt	220,000
25	V4 screen decoupling	99,000	53	V3 A.V.C. decoupling	2 meg.
26	A.V.C. line decoupling	1 meg.			



The circuit (left) is shown in two sections solely for reasons of presentation. It includes an H.F. amplifier, two I.F. valves, and a paraphase stage feeding push-pull output valves.

Below, the switch banks numbered to correspond with the circuit diagram. Chassis layout drawings are on page IV.



V8. Set receiver to S.W.1 band and tuning control to maximum capacity setting of gang. Set sensitivity and volume controls to maximum and treble and bass tone controls for maximum cut.

Connect a service oscillator (via a .0005 to .1 mfd. fixed condenser) to top grid cap of V2 and chassis, leaving normal connection still attached.

Tune oscillator to 456 kc. and adjust T19, T20, T21, T22, T23 and T24 in that order for maximum response. Progressively reduce the input from the service oscillator to keep below the A.V.C. point.

Signal Circuits.—Check that the scale is central in clips, that the pointer is vertical and the limits of travel are symmetrical
(Continued on page 12)

G.E.C MODEL 3910 SUPER TEN

(Continued from page 11)

with respect to scale, being approximately 5/32 in. from each end of the horizontal lines. Check that when pointer is at end of right-hand travel the gang vanes are fully meshed.

Connect the oscillator to the A. and E. sockets via a dummy aerial (S.W. dummy aerial on short wave bands), only feeding sufficient input to obtain reliable peaks.

Long Waves.—Tune set and oscillator to 1,000 metres (300 kc.), and adjust T17, T10 and then T5 for maximum.

Tune set and oscillator to 1,818 metres (165 kc.), and adjust T18 for maximum, at the same time rocking the gang.

Repeat both operations.

Medium Waves.—Tune set and oscillator to 214 metres (1,400 kc.), and adjust T15, T9 and then T4 for maximum.

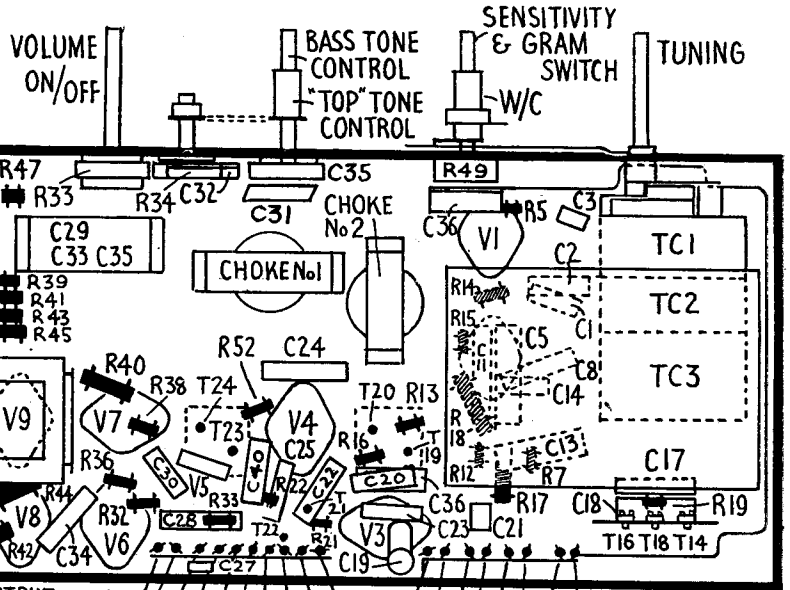
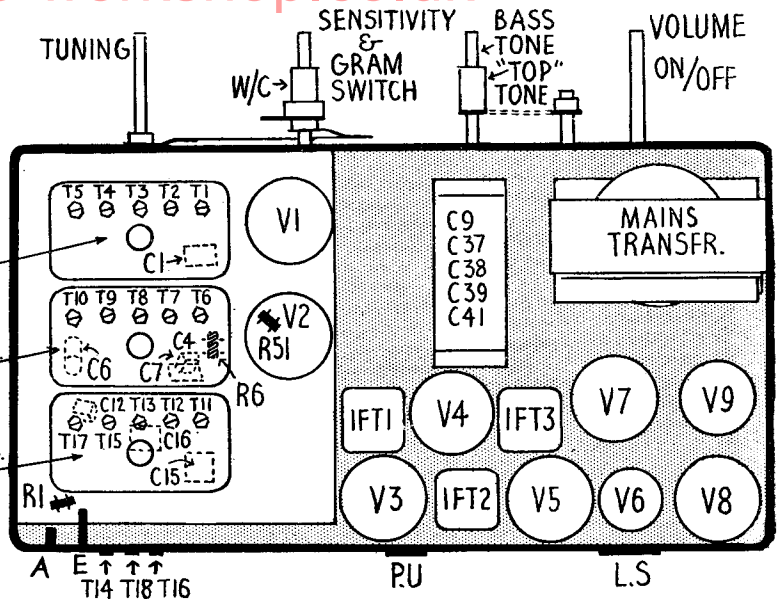
Tune set and oscillator to 536 metres (560 kc.), and adjust T16 for maximum, at the same time rocking the gang.

Repeat both operations.

Range 3 (75-200 metres).—Tune set and oscillator to 75 metres (4 mcs.), and adjust T13, T8 and then T3, rocking the gang while adjusting T8 and T3.

Tune set and oscillator to 187.5 metres

(Continued in column 3.)



The top and underside layout drawings for the BC.3910.

WINDINGS (D.C. Resistances)

L.	Ohms.	Range.	Where measured.
1	.85	B1	Aerial socket and C1.
2	Very low.	B1	W2 and C1.
3	.35	B2	Aerial socket and C1.
4	.15	B2	W2 and C1.
5	.2	B3	Aerial socket and C1.
6	1.2	B3	W2 and C1.
7	4.1	M.W.	W2 and C1.
8	32.4	L.W.	W2 and C1.
9	.7	B1	W3 and C5.
10	Very low.	B1	W4 and C7.
11	.9	B2	W3 and C5.
12	.2	B2	W4 and C7.
13	1.5	B3	W3 and R6.
14	1.3	B3	W4 and C7.
15	3.8	M.W.	W3 and R6.
16	4.1	M.W.	W4 and C7.
17	31.8	L.W.	W4 and C7.
18	.9	B1	W5 and C15.
19	.05	B1	W6 and C15.
20	.6	B2	W5 and C16.
21	.2	B2	W6 and C16.
22	.3	B3	W5 and C17.
23	1.1	B3	W6 and C17.
24	1.5	M.W.	W5 and chassis.
25	4.5	M.W.	W6 and C18.
26	2.3	L.W.	W5 and chassis.
27	14.1	L.W.	W6 and T18.
L.F.T.1 prim.	7.7	—	Across R13.
L.F.T.1 sec.	7.3	—	Across R16.
L.F.T.2 prim.	4.4	—	Across R21.
L.F.T.2 sec.	4.4	—	Across R22.
L.F.T.3 prim.	4.2	—	Across R52.
F.T.3 sec.	4.4	—	C26 and R29 ± R30.
Choke 1	70	—	Across leads.
Choke 2	440	—	Across leads.
Field 1 and 2 in parallel.	280	—	Tags spkr. panel.
O.T. prim.	250	—	R40 and R44.
M.T. prim.	6.6	—	Across mains plug.
Total H.T. sec.	133	—	Anode pins V9.

VALVE READINGS

No signal. Volume maximum. M.W. min. capacity. 200 volts. A.C. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	KTW63	Anode	175	5.5
		Screen	100	1.4
2	X 65	Anode	244	2.5
		Screen	100	4.7
		Osc. anode	80	4.5
3	KTW. 63	Anode	236	7
		Screen	100	1.5
4	KTW. 63	Anode	250	7.3
		Screen	100	1.7
5	D.H. 63	Anode	136	.7
6	KTW. 63	Anode	126	.9
7	KT.66	Anode	263	80
		Screen	270	5
8	KT.66	Anode	263	80
		Screen	270	5
9	U.52	Cathode	340	—
T1.	Y63/Y64	—	—	—

(Continued from column 1)

(1,600 kc.), and adjust T14, simultaneously rocking the gang.

Repeat both operations.

Range 2 (25-75 metres).—Tune set and oscillator to 25 metres (12 mcs.), screw T12 right up, and then unscrew until the second peak is heard. Then adjust T7 and T2 for maximum response.

The padding is fixed.

Range 1 (11-25 metres).—Tune set and oscillator to 12.5 metres (25 mcs.), screw T11 right up, and then unscrew until the second peak is heard. Then adjust T6 and T1 for maximum.

Replacement Condensers

Exact replacement condensers are available from A. H. Hunt, Ltd., for the two blocks in this receiver. For the one containing C's 29, 33 and 35, there is unit 4189, 6s. 6d., and for that containing C's 38, 37, 39, 41 and 9, unit 4190, 10s. 6d.