FERRANTI ALL-WAVE STRAIGHT THREE

CIRCUIT.—On the short waves the aerial input is direct to the grid of V1, a variable-mu H.F. pentode, and the medium- and long-wave coils form a choke input circuit. On the medium and long waves the input is either direct or through a Droitwich filter to V1 through an inductively coupled tuned input circuit.

V1 is coupled to V2, a screen-grid valve, by choke and capacity coupling. The signal then passes by resistance and capacity coupling to the pentode output valve, V3.

On the short waves, reaction is applied to the tuned-grid coil from the anode of V2 through a coil and control condenser.

The output from V3 is fed to the speaker by a transformer having a condenser across the primary to provide a certain amount of tone correction.

Mains equipment consists of transformer, full-wave directly heated rectifier, the speaker field and electrolytic condensers.

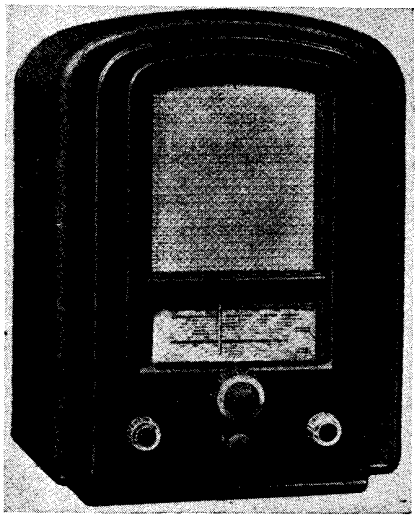
Special Notes.—Should it be found necessary to disconnect the speaker this may be done by unplugging the leads from the top of the mains transformer. These leads are colour coded, and care should be taken to see that they are returned to the correct sockets. The order of connection, looking from the back of the set, is: (1) blue, (2) green, (3) red, (4) black.

Adjustment of the Droitwich wave-trap

(*Continued on next page.*)

CONDENSERS

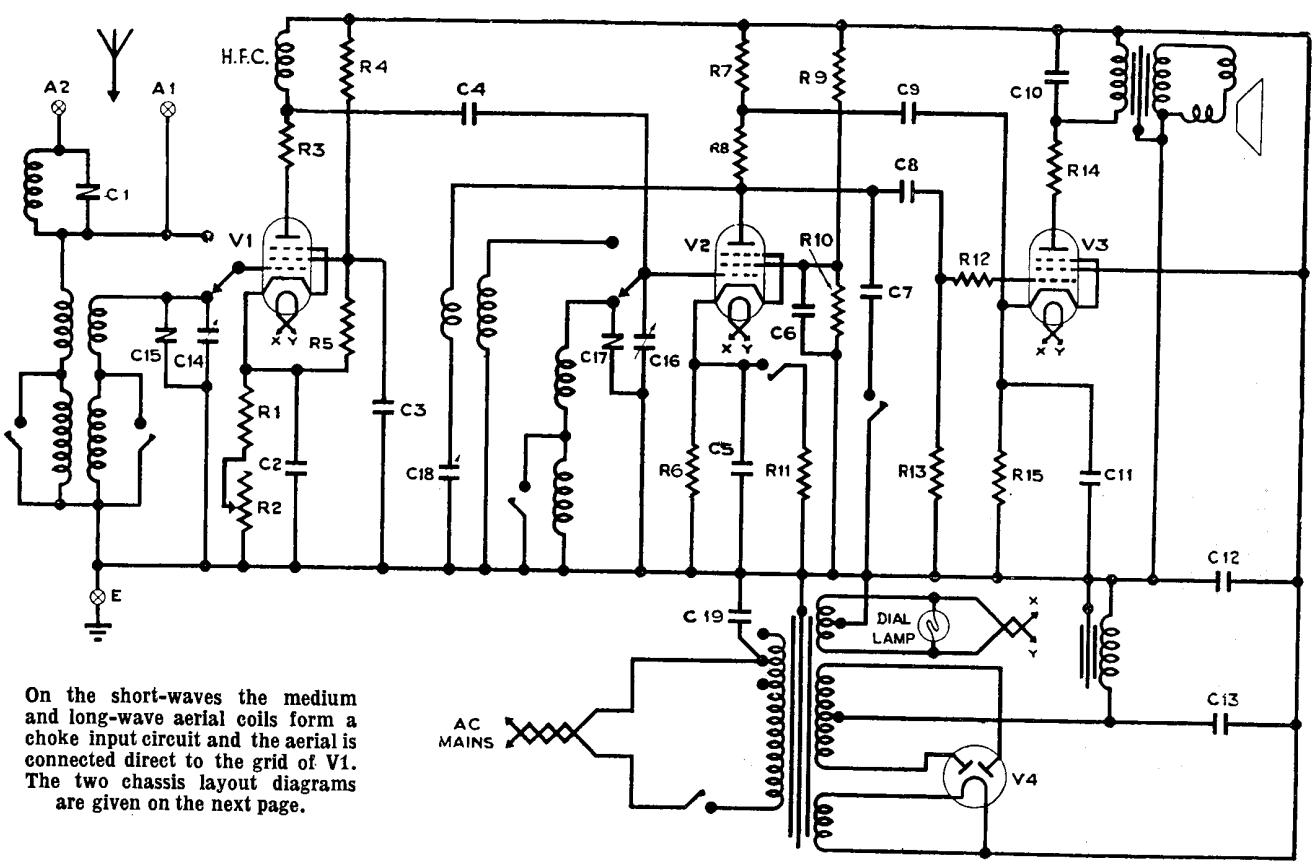
C.	Purpose.	Mfd.
1	Wave trap	—
2	V1 cathode by-pass	.05
3	V1 screen by-pass	.1
4	V1 and V2 coupling	.00016
5	V2 cathode by-pass	10.
6	V2 screen by-pass	1.
7	V2 anode by-pass	.00015
8	V2–V3 coupling	.01
9	V2 anode decoupling	1.
10	Tone control	.01
11	V3 cathode by-pass	50
12	H.T. smoothing	8.
13	H.T. smoothing	8.
14	Aerial tuning	—
15	Aerial trimmer	—
16	H.F. tuning	—
17	H.F. trimmer	—
18	Reaction	.0003
19	Mains earth	.002



The Ferranti All-wave Straight Three is an A.C. mains receiver in which all three valves are employed on the short-waves but only the detector circuit is tuned. High-efficiency Litz-wound coils are employed to secure high gain and selectivity.

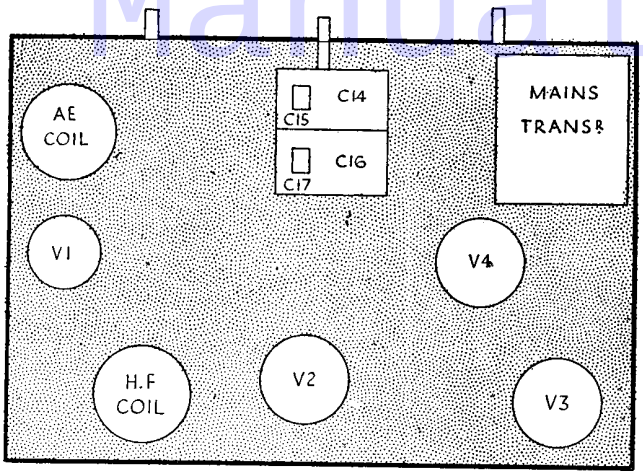
RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias	70
2	Volume control	15,500
3	V1 anode stopper	140
4	V1 screen feed	8,000
5	V1 screen bleeder	50,000
6	V2 bias	15,000
7	V2 anode decoupling	6,000
8	V2 anode feed	500,000
9	V2 screen feed	250,000
10	V2 screen bleeder	30,000
11	V2 cathode bias	2,500
12	V3 grid stopper	50,000
13	V3 grid leak	1 meg.
14	V3 anode stopper	140
15	V3 cathode bias	140

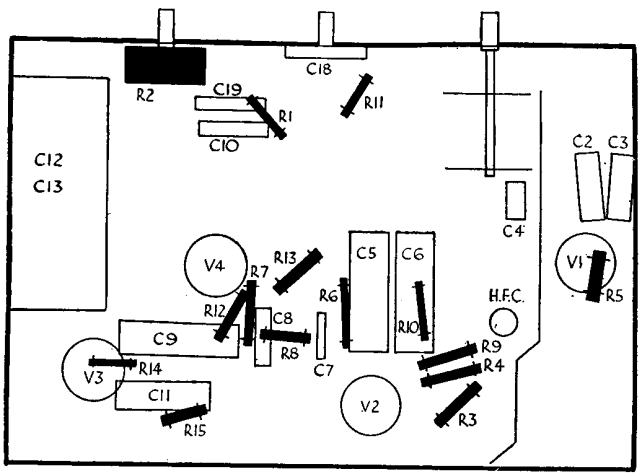


On the short-waves the medium and long-wave aerial coils form a choke input circuit and the aerial is connected direct to the grid of V1. The two chassis layout diagrams are given on the next page.

FERRANTI ALL-WAVE STRAIGHT THREE (Continued)



The parts are liberally spaced on top of the chassis of the Ferranti All-wave Straight Three. All the coils are housed in two cans, each placed near its respective valve. The dial assembly is removed with the chassis and consequently its overhaul is a straightforward matter.



Nearly all the parts below the chassis are suspended in the wiring. The front section of the switch contains, in this order, S6, S3 (two sets of contacts combined), S2, S1 and S7. The rear sector carries S4 and S5 (two sets of contacts combined).

condenser, C1, should be made with the aerial connected to terminal A2. The set is tuned to the Droitwich transmitter, and C1 is then adjusted for minimum signal strength.

The dial lamp is a 6 volt .3 amp. type.

The values of the condensers are indicated by the following colour code: Tubular condensers, .002 mfd., 1,500 v. test, one brown band; .05 mfd., 750 v. test, one red band; .1 mfd., 750 v. test, one grey band and one green band; .01 mfd., 1,000 v. test, two green bands; mica condensers, .00015 mfd., one brown spot; .0003 mfd., two yellow spots.

Removing Chassis.—Remove the knobs from the front of the set. They are secured by spring clips and pull off. Remove four screws from underneath the cabinet.

The chassis can be removed far enough from the cabinet for the usual inspection and test without removing the speaker.

QUICK TESTS

The terminal strip on top of the mains transformer carries the leads to the speaker and is available for a quick test without removing the chassis.

The volts between the tags and the chassis should be:—

Red lead, unsmoothed H.T., 210 volts.
Green lead, 200 volts.

VALVE READINGS

Medium wave band. No signal. Volume at maximum.

V.	Type.	Electrode.	Volts.	M.a.
1	VPT4B (7) (Met) ..	Anode ..	200	10.5
		Screen ..	140	5
2	SPT4A (7) (Met) ..	Anode ..	40	.2
		Screen ..	20	—
3	PT4D (7) ..	Anode ..	195	28
		Screen ..	205	5.75
4	R 4 (4) .. All Ferranti	Filament	210	—

Connecting Additional Speakers

Good quality low-capacity shielded cable should be employed for extension speaker leads, and tests should be carried out before a practical trial is made.

The two leads should be tested for "shorts" between themselves and between them and the shielding. For a continuity test join the wires together at one end of the cable and apply an ohmmeter or other tester at the "open" end.

A good switch to incorporate when fitting a receiver with an extra speaker is a simple two-way-and-off type. The extra speaker is connected in series with the one in the set. The two poles of the switch are connected to the common input to the speakers, and the centre pole is joined to the lead between the speakers.

This enables either speaker to be silenced.