

# BURNDEPT UNIVERSAL MODEL 210

**Circuit.**—A combined first detector-oscillator, FC13 (V1) met., is preceded by a single tuned aerial transformer with an I.F. trap in the aerial lead and a 1,149 k.c. trap across the primary on long waves.

Volume is controlled manually by simultaneously damping the aerial circuit and varying the bias on V1 and V2. Coupling to the next valve is by band pass I.F. transformer (frequency 473). The oscillator has the tuned coil in the grid circuit.

The I.F. valve, VP13A (V2) met., is coupled to the second detector by another band-pass I.F. transformer.

The second detector valve, SP13 met. (V3), works as an anode bend detector and has the auxiliary grid fed through a potentiometer. Coupling to the output valve is by resistance capacity filter.

The output pentode, Pen.26 (V4), has an H.F. stopper in the grid circuit and is tone-compensated by a condenser between the anode and chassis.

Tone control is provided by means of a variable resistance in series with a condenser across the grid leak.

Mains equipment consists of a barretter

lamp, C1; a UR2 full-wave rectifier used as a half-wave, and a smoothing choke with electrolytic condensers. The L.S. field is connected across the unsmoothed H.T.

**Special Notes.**—See that the P.U. shorting link is in the P.U. sockets.

The heater ratings are:—Rectifier, 30 volts at .2 amp.; Pen. 26, 24 volts at .2 amp.; SP13, VP13A and FC13, 13 volts at .2 amp.

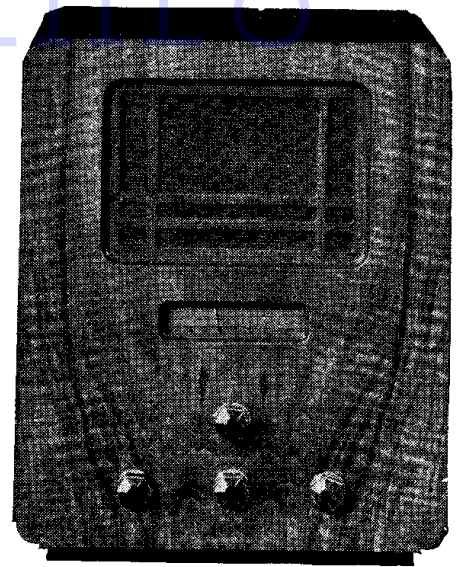
Mullard universal bases are fitted throughout.

Note that in these valves the top terminals are all control grids.

**Quick Tests.**—The most convenient H.T.—point on the chassis is the frame of the dial. Between the following terminal tags on the speaker and the chassis, (mains voltage 230 A.C.) the voltages are:—

- Top (1) green, 0 volts.
- (2) black, 204 volts (H.T. smoothed).
- (3) blue, 182 volts (V4 anode).
- (4) red, 226 volts (H.T. unsmoothed).

**Removing Chassis.**—Remove knobs (grub screw) and release the cleat holding



The model 210 Universal superhet receiver by Burndept, Ltd.

## CONDENSERS

C.	Purpose.	Mfd.
1	In series with aerial lead	.02
2	In series with earth lead	.5
3	V1 cathode	.1
4	Osc. grid	.001
5	L.W. tracking on osc.	var.
6	V1 aux. grid	.1
7	V2 cathode	.05
8	V2 aux. grid	.05
9	In P.U. lead	.25
10	V3 cathode	50 el.
11	V3 aux. grid	.05
12	V3 anode by-pass	.0002
13	L.F. coupling V3 to V4	.02
14	Tone control circuit	.002
15	V4 cathode	25 el.
16	Extra L.S. filter	.25
17	Tone compensating V4 anode	.005
18	V4 aux. grid	.5
19	H.F. by-pass from mains	.1
20	H.T. smoothing	8 el.
21	H.T. smoothing	16 el.
22	Forming hum trap with choke	.02

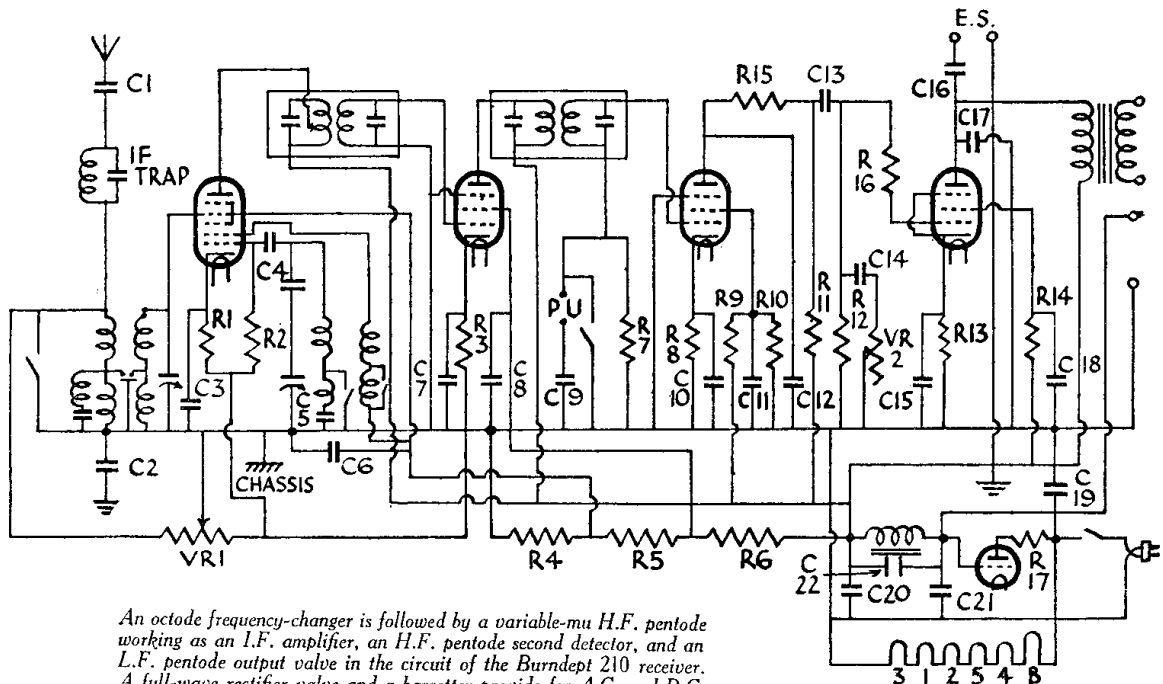
## RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias (fixed)	250
2	Osc. grid leak	50,000
3	V2 cathode bias	500
4	Part of H.T. feed ptr.	25,000
5	Part of H.T. feed ptr.	2,500
6	Part of H.T. feed ptr.	10,000
7	Across P.U.	.25 meg.
8	V3 cathode bias	5,000
9	Upper part of V3 aux. grid ptr.	100,000
10	Lower part of V3 aux. grid ptr.	50,000
11	V3 anode L.F. coupling	.25 meg.
12	V4 grid leak	.5 meg.
13	V4 cathode bias	400
14	Voltage dropping to V4 aux. grid	20,000
15	H.F. stopper in V3 anode	50,000
16	H.F. stopper in V4 grid	.5 meg.
17	Anode circuit of rectifier	100.
	L.S. Field	7,550
	P. of output transformer	250

## VALVE READINGS

Valve	Type.	Electrode.	Volts.	M.a.
1	F.C.13	anode	208	.6
		aux. grid	76	4.3
		osc. anode	76	1.6
2	V.P.13A	anode	204	3.2
		aux. grid	100	1.4
		anode	49*	.3
3	S.P.13	aux. grid	55	.1
		anode	182	33
		aux. grid	110	4.8

\* Deceptive reading due to high value of anode resistance. The important factor is the anode current.



An octode frequency-changer is followed by a variable-mu H.F. pentode working as an I.F. amplifier, an H.F. pentode second detector, and an L.F. pentode output valve in the circuit of the Burndept 210 receiver. A full-wave rectifier valve and a barretter provide for A.C. and D.C. supplies respectively.

### BURNDEPT MODEL 210 UNIVERSAL (Cont.)

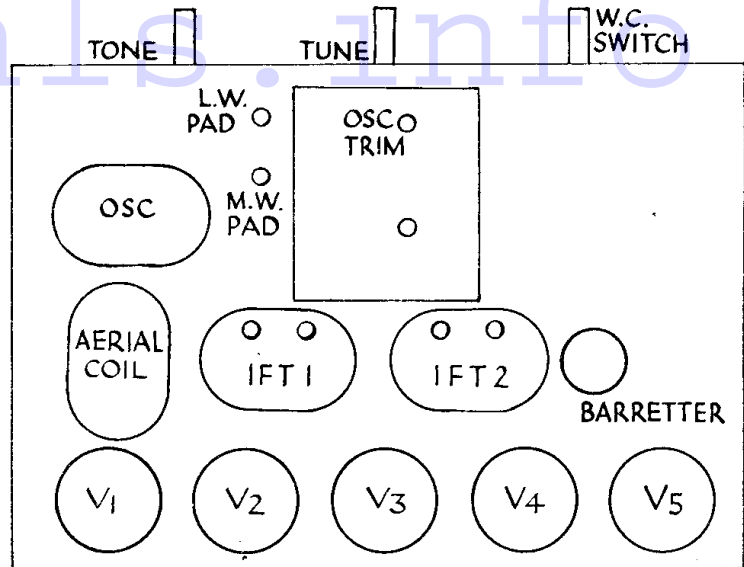
the speaker cable. Remove four holding screws underneath and lift the chassis out.

**General Notes.**—The I.F. frequency is 473 k.c. The correct method of trimming is as follows:—Connect modulated oscillator to top (grid) cap of V1 and gang IFT1 and IFT2. Connect oscillator to aerial socket on same frequency, and after increasing volume to maximum, reduce to minimum by adjusting the I.F. trap (see diagram).

Adjust on M.W. at 200 metres and at 500 metres. Adjust L.W. padding condenser on 2,000 metres.

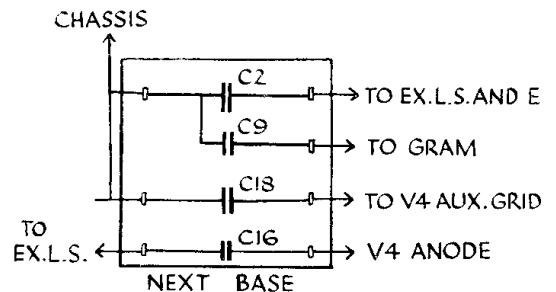
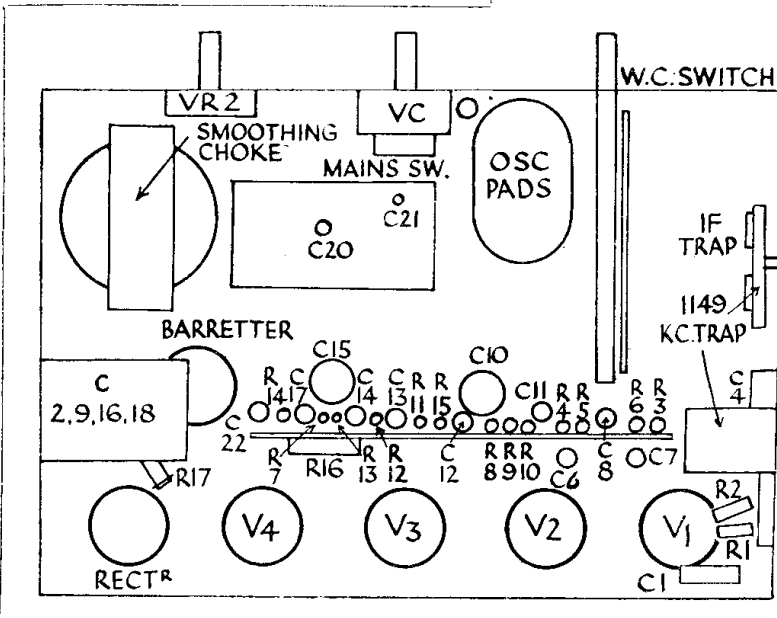
Before attempting to replace any component on the resistance and condenser panel make sure with which tag the leads should make contact. Several of them appear to be connected to tags with which they are not actually making any contact. If in any doubt the resistance table and the circuit diagram should be consulted.

**Replacing Chassis.**—Lay chassis inside cabinet, replace holding screws, cable cleat and knobs.



Above is shown the arrangement of parts on top of the Burndept chassis including the padding trimmers. How the set should be trimmed is described under "General Notes."

Below on the left is the underneath layout of the chassis of the Burndept 210 A.C.-D.C. receiver. On the right is a detail drawing of the condenser block.



## KOLSTER-BRANDES A.C. "NEW PUP"

**Circuit.**—The detector valve 41MH (V1) operates as a power grid detector, and follows a tuned secondary aerial transformer, alternative aerial tappings being provided by A1, A2 and A3 on the primary, and A4 on the secondary.

Reaction is applied by a differential condenser, of which the rotor vanes are at chassis potential. The anode circuit includes an H.F. filter, and is properly decoupled. Coupling to the next valve is by resistance capacity filter.

The output valve, a seven-pin AC2 Pen (V2), has a grid stabilising resistance, and is biased by a resistance in the cathode lead.

Mains equipment (on a separate chassis) consists of: Transformer with screened primary, full-wave R2 rectifier, and an L.S. field used for smoothing in the negative lead in conjunction with two 8 mfd. electrolytic condensers.

**Quick Tests.**—Voltages between the terminals on top of the L.S. transformer and

chassis (looking from the back and counting from the left):—

- (2) 210 volts positive (V2 anode);
- (5) 230 volts positive (H.T. smoothed);
- (6) 70 volts negative (voltage drop across field coil).

**Removing Chassis.**—Pull off the knobs, taking care not to drop the leaf springs inside. Remove two screws from flange at back of chassis and one on each side of the plate holding the chassis to the front of the cabinet. Remove three screws from the aerial panel and lift out the lower chassis.

The set can be tested quite conveniently without removing the power pack.

**Removing Power Pack.**—Undo the cleat holding the connecting leads; remove the four bolts at the sides, and lift the unit out complete with speaker.

**General Notes.**—The lettering on the power pack lay-out diagram for the mains tappings is: W, white; Y, yellow; G, green.

The terminals on the small panel are (our lettering):—

- (A) Black to C8 and black with red tracer to F.C.;
- (B) Black, to mains; blue, to mains transformer;
- (C) Red, to mains; white, to mains switch;
- (D) Blue, to V2 anode and L.S. transformer;
- (E) Red H.T. + to rect. heater, C7 and C8, and H.T. +;
- (F) Grey, set heaters (black from transformer);

(Continued on next page.)

#### VALVE READINGS

Valve.	Type.	Electrode.	Volts.	M.a.
1	41MH	anode	100	3.5
2	AC2/Pen. (7 pin)	anode	210	28
		aux. grid	230	6