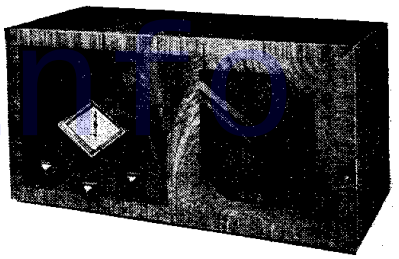
BURGOYNE SUPERHET FIVE (Cont.)

RESISTANCES

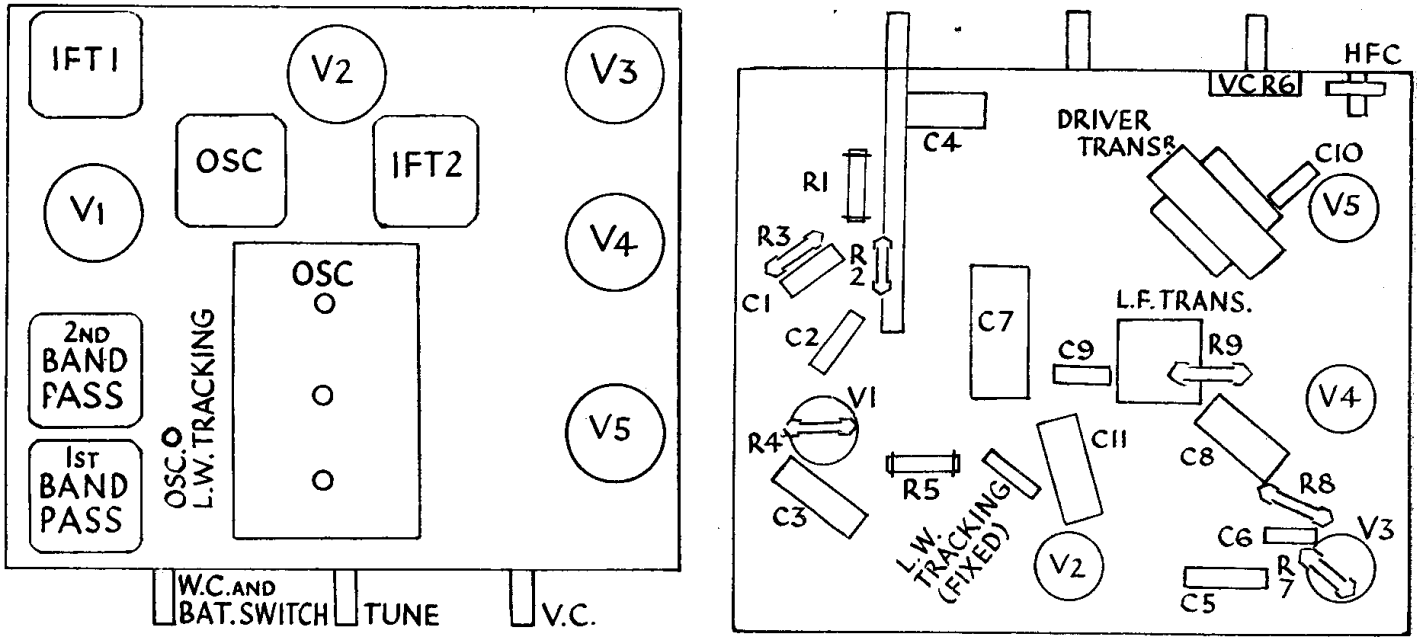
R.	Purpose.	Ohms.
1	In series across second band pass coil.	40,000
2		1,000
3	Bias feed to V1	25,000
4	V1 grid leak	1 meg.
5	In series with V2 grid return...	1 meg.
6	Var. volume control across G.B.	50,000
7	V3 grid leak	1 meg.
8	V3 anode, L.F. coupling ...	25,000
9	V4 grid, H.F. stopper	250,000

CONDENSERS

C.	Purpose.	Mfd.
1	Band-pass coupling	.025
2	V1 grid	.0001
3	V1 and V2 aux. grids	.1
4	Decoupling bias from aerial circuit.	.1
5	V3 grid	.00015
6	Feed to reaction coil	.001
7	Across H.T.	2
8	L.F. coupling to L.F. transformer.	.1
9	H.F. by-pass from V4 grid ...	.0005
10	Stabilising V5 anodes	.01
11	Across L.T.	40 el.



The Superhet Five battery receiver by Burgoyne Wireless (1930) Ltd.



In the Burgoyne receiver the long-wave tracking condenser can be adjusted from the top of the chassis. As the under layout (right) shows small components are mounted as close as possible to the larger parts.

KOLSTER-BRANDES 381 SUPERHET

Circuit.—The combined detector oscillator valve, 15D1, or 13PGA (V1), is preceded by a band-pass aerial coupling. Bias is obtained by fixed cathode resistance and from the A.V.C. line. The tuned oscillator circuit is in the oscillator grid and a harmonic limiting resistance is connected directly in the anode circuit. Coupling to the next valve is by band-pass I.F. transformer (frequency 130 kc.).

The I.F. valve, 9D2, or 13VPA (V2), is also biased by cathode resistance and A.V.C., and is coupled to the next valve by another band-pass I.F. transformer.

The second detector and L.F. amplifying valve, 11D3, or 13DHA (V3), is a double diode triode. The A.V.C. diode anode is coupled to V2 anode through a condenser, C13, with R10 as the load resistance. The L.F. impulses are taken from the other diode anode through the secondary of IFT2, and an H.F. stopper, R13, to the coupling condenser, C17. The grid leak potentiometer acts as a volume control.

Bias is by cathode resistance, which provides the delay action for the A.V.C. Resistance capacity coupling is used between the triode section and the output valve.

The output valve, 7D3, or 40PPA (V4), is a pentode with which tone compensation is obtained by a condenser, C20, between the anode and chassis.

Mains equipment consists of voltage dropping resistance for mains adjustment, half-wave, 7D3, or 40SUA rectifier, which acts as pure D.C. resistance on D.C., with both a choke and field coil in the positive lead for smoothing.

An additional smoothing and decoupling resistance, R2, is used for V1, V2, V3 and V4 auxiliary grid.

Special Notes.—Heater wiring in order from mains adjustment resistance :—Rectifier, V4, V2, V1 and V3. Valves are .13 volt universal type, except V4 and rectifier, which are 38 volt types.

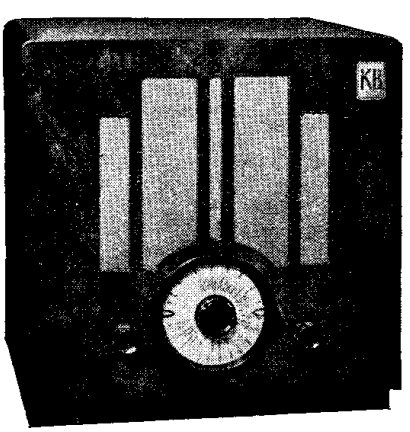
A safety device which disconnects the mains when the back is removed is fitted. To test the set the back can be turned upside down and the two plates inserted so as to make contact with the springs inside, when the chassis has been eased backwards.

In some models the block condenser with

VALVE READINGS

No signal. See "special notes" regarding mains voltages. Taken with 220 v. supply and 225 v. tap.

Valve.	Type.	Electrode.	Volts.	M.A.
1	15D1 or 13PGA	anode ..	125	5
		screen ..	55	4½
		osc. anode ..	120	5
2	9D2 or 13VPA	anode ..	140	8
		aux. grid ..	100	2
3	11D3or13DHA	anode ..	80	.1
4	7D3 or 40PPA	anode ..	140	35
		aux. grid ..	140	8



The model 381 marketed by Kolster-Brandes Ltd., is a five-valve superhet for A.C. mains operation.

C8, C12, C9, had .1 mfd. for C9, in which case an additional (tubular) condenser, C9A, was connected across C9. In later models, C9 is increased to the requisite value inside the block.

In some early models the mains adjustment resistance was only in the heater cir-

KOLSTER-BRANDES MODEL 381 (Cont.)

cuit and not in the H.T. circuit, but in later models (with E or subsequent letters following the serial number) the circuit is as shown in the diagram, in which the pilot lamps are connected across the small section through which the H.T. also flows. Both methods of

(*Continued on next page.*)

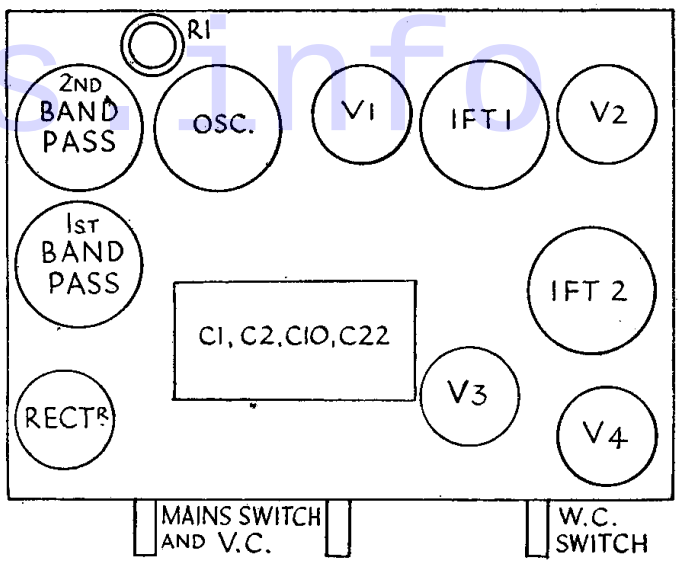
CONDENSERS

C.	Purpose.	Mfd.
1	H.T. smoothing	8 el.
2	H.T. smoothing	8 el.
3	By-pass from mains	.01
4	Series with earth lead	.01
5	Decoupling V1 grid	.02
6	L.W. pad on oscillator (twisted wire)	9 mmfd.
7	V1 oscillator grid reservoir	.0001
8	V1 cathode by-pass	.1
9	V1 screen by-pass	.5
10	H.T. by-pass	4 el.
11	V2 aux. grid	.1
12	V2 grid decoupling	.1
13	Feed to AVC diode anode (twisted wire)	9 mmfd.
14	V2 cathode by-pass	.1
15	Diode reservoir and H.F. by-pass	.0001
16	H.F. by-pass	.0001
17	L.F. feed to triode grid	.02
18	V3 cathode by-pass	25 el.
19	L.F. coupling V3 to V4	.02
20	Tone compensating; V4 anode two in parallel)	.012
21	V4 cathode by-pass	25 el.
22	H.T. smoothing	4 el.

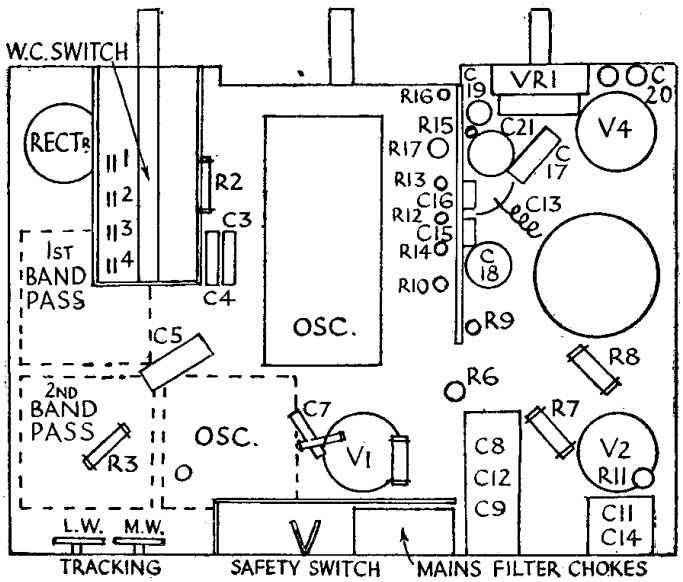
RESISTANCES

R.	Purpose.	Ohms.
1	Mains voltage adjustment	630
2	Voltage dropping to V1, V2 and V3	300
3	V1 grid decoupling from AVC	100,000
4	V1 osc. anode circuit	2,500
5	V1 osc. grid leak	25,000
6	V1 cathode bias	150
7	Decoupling V1 screen	15,000
8	Decoupling V1 and V2 screens	15,000
9	Decoupling AVC.	100,000
10	AVC diode load	500,000
11	V2 cathode bias	300
12	V3 diode load	500,000
13	H.F. stopper	100,000
14	V3 cathode bias	10,000
15	V3 anode, L.F. coupling	250,000
16	V4 grid leak	250,000
17	V4 cathode bias	500

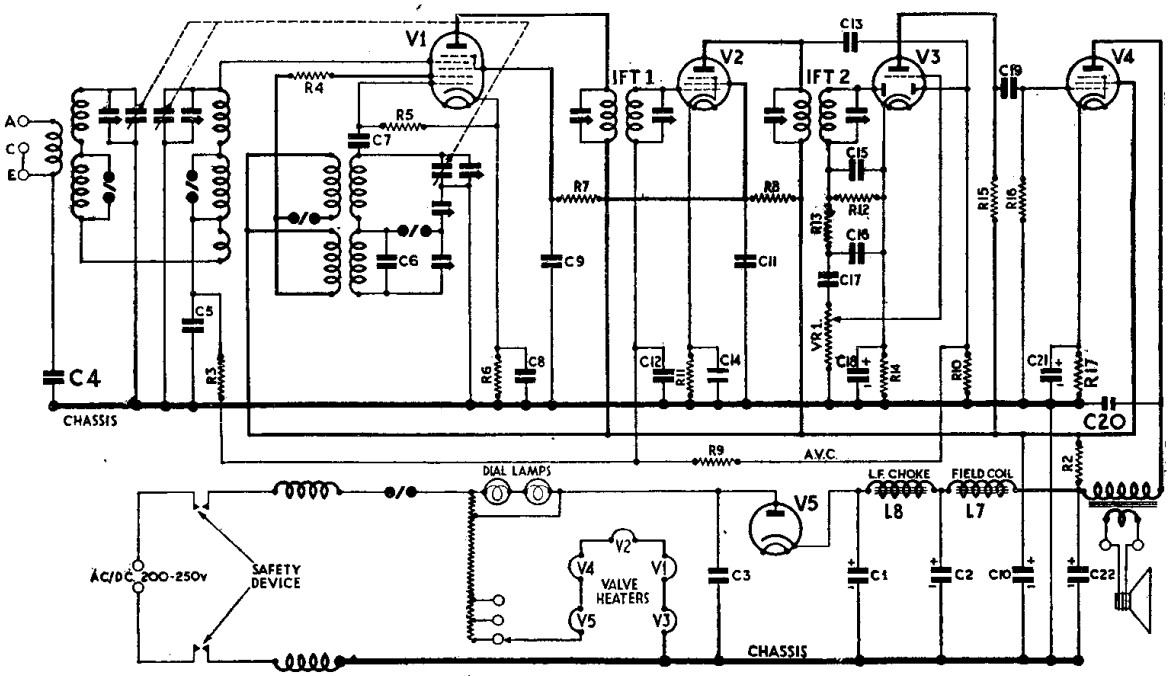
In the 381 the voltage adjustment is for the heater circuit. The rectifier and output valves are rated for 38 volts each.



In working with this set make sure that you are not making contact with any earthed object before connecting the mains.



The Kolster-Brandes 381 is for A.C. mains operation only but utilises universal type valves run direct from the mains through a voltage dropping resistance.



KOLSTER-BRANDES MODEL 381 (Cont.)

connection cause the valve anode voltages to be dependent on the actual mains voltage.

Quick Tests.—Use two metal clips to make contact in safety device. *Caution*: It is advisable to make sure that you are not making contact with anything that is earthed while working with these sets.

Voltages between the following leads and chassis on 220 A.C. supply:—Red and black, H.T. unsmoothed, 230 volts; black, H.T. smoothed by choke, 220 volts; blue, V4 anode, 140 volts; red, H.T. smoothed, 150 volts.

Removing Chassis.—Remove the knobs. The grub screws are covered with wax insulation and engage in cross-cut grooves in the spindles.

Remove the six wood screws from the black, wooden blocks underneath the cabinet and undo the chassis-holding screws. Slide the cardboard plate out from underneath the chassis and lift the chassis out.

General Notes.—Wiring colour code:—Red, H.T.; blue, anodes; green, grid; orange, screens or auxiliary grids; dark brown, heaters; light brown, cathodes; yellow, A.V.C.; black with red tracer, negative of smoothing circuits; black, earth (chassis).

In the wiring to the block electrolytic condenser on top of the chassis, the red leads are connected to C1 and C2, and the yellow leads to C10 and C22.

Ganging Frequencies.—I.F.T1 and I.F.T2, 130 kc.; osc., trimmer, 1,400 kc.; M.W. tracker, 600 kc.; L.W. tracker, 175 kc.

Pilot Lamps.—These can be reached easily by removing the back and sliding out the cardboard plate and sliding the holding clips downwards.

Replacing Chassis.—Lay chassis inside cabinet, replace cardboard, the four holding screws, the two black supports, and the knobs. Replace the insulating wax.

McMICHAEL DUPLEX TRANSPORTABLE

Circuit.—The H.F. valve, 215S.G. (V1), is preceded by the frame aerial, of which the long-wave section is short circuited for use on the M.W. band. Bias is obtained by taking the grid leak to a tapping on a potentiometer across the G.B. section of the battery, and the screen potential is taken from the low H.T. end of the decoupling resistance of the first L.F. valve.

Coupling to the next valve is by H.F. choke and condenser filter. Volume is controlled by a variable resistance in series with the positive lead to this valve.

The detector valve, HL2 (V2), operates as a leaky grid detector with swinging coil reaction. The grid leak is connected to the centre tap of a potentiometer across the L.T. Coupling to the next valve is by parallel-fed transformer, and a resistance, R6, is included in the circuit to act as an H.F. stopper.

The first L.F. valve, HL2 (V3), has the gramophone jack connected in its grid circuit and an additional H.F. stopper. Another parallel-fed transformer couples V3 to the next valve.

The driver valve, 215P (V4), is used in the conventional way, and is coupled to the output Class B valve, 240B (V5), by a typical driver transformer.

The anode circuits of V5 are stabilised by condensers between the anodes and H.T.+, and tone compensation is provided by a condenser and resistance in series between the anodes. The H.T. battery is by-passed by an 8 mfd. electrolytic condenser.

Both H.T.— and L.T.+ are broken by the switch.

Special Notes.—The H.T. battery is a special Grosvenor type SR490DL. Connections are: H.T.+, 99 volts; G.B.—, —6 volts.

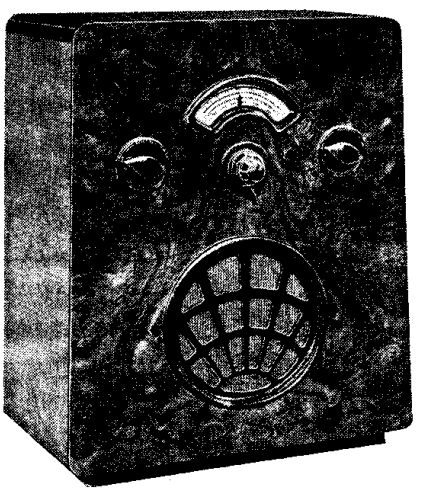
Quick Tests.—These consist in taking valve readings and observing the plops, and by connecting a P.U. to test from V3.

Removing Chassis.—Remove tuning knobs (grub screw) and wave-change switch lever. There is no need to remove the volume or reaction knobs.

Remove the four hexagonal screws at the ends of the valve compartment and the wooden chuck clamping the bottom of the battery compartment.

Remove the six screws from the board at the back of the latter, and unsolder the L.S. leads. (There is no need to mark these as the order of connection is the same as that on the L.S. transformer.)

(*Continued on opposite page.*)



A five-valve Class B battery receiver the Duplex Transportable by McMichael Radio Ltd. is completely self-contained.

VALVE READINGS

[V.C. max.]

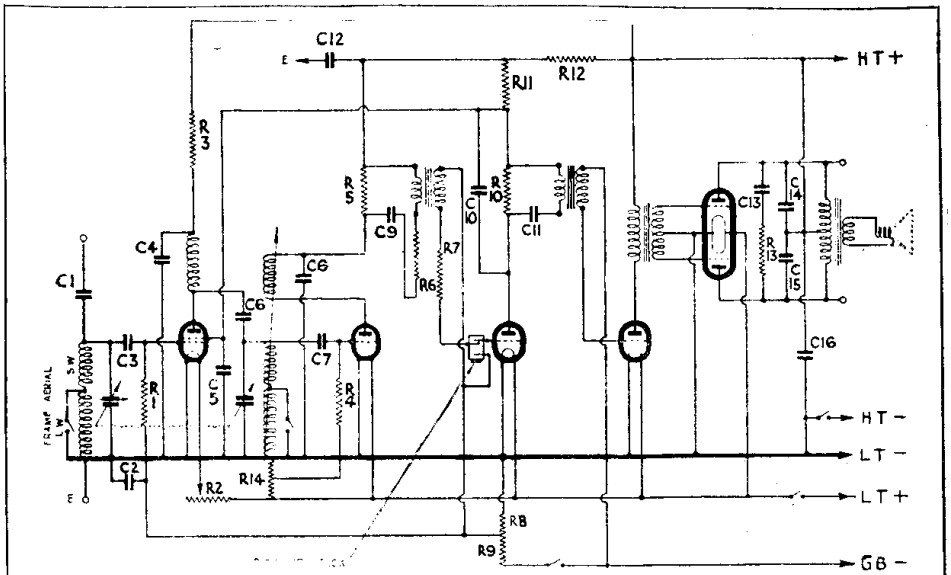
Valve.	Type.	Electrode.	Volts.	Ma.
1	215 S.G. ...	anode ...	98	1.5
		screen ...	35	
2	HL2 ...	anode ...	50	.5
3	HL2 ...	anode ...	30	.5
4	215P ...	anode ...	100	3.5
5	240B. ...	each anode	100	1

RESISTANCES

R.	Purpose.	Ohms.
1	V1 grid leak	.5 meg.
2	V1 rheostat	20
3	V1 anode decoupling	2,000
4	V2 grid leak	2 meg.
5	V2 anode coupling	30,000
6	H.F. stopper in transformer feed	20,000
7	H.F. stopper in V3 grid circuit...	.5 meg.
8	Bias ptr. for V1 and V3 ...	400
9	Bias ptr. for V1 and V3 ...	2,000
10	V3 anode coupling	30,000
11	Decoupling V3 anode and voltage dropping to V1 screen.	50,000
12	Voltage dropping to V2 and V3	10,000
13	Tone compensating circuit in V5 anodes.	10,000
14	Potentiometer across L.T. ...	250+250

CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial	.00003
2	Decoupling V1 grid	.25
3	V1 grid	.001
4	Decoupling V1 anode	1
5	V1 screen	1
6	H.F. feed to tuned grid coil ...	.001
7	V2 grid	.0002
8	V2 anode by-pass	.001
9	L.F. feed to transformer I ...	.5
10	V3 anode by-pass (to H.T.) ...	.001
11	L.F. feed to transformer II ...	.5
12	Decoupling H.T. to V2 and V3	1
13	Tone compensating circuit V5 anodes.	.002
14	Stabilising V5 anode	.002
15	Stabilising V5 anode	.002
16	Across H.T.	8 el.



One H.F. amplifier is used in the McMichael Duplex Transportable. Magnetic reaction is applied to the H.F. coupling and two L.F. valves in addition to a Class B type follow the detector.

KB 381

Four-valve, plus rectifier, two-waveband superhet for operation from AC or DC mains, 195–255 volts 40–100 cycles. Marketed 1934, by Kolsters Brandes, Cray Works, Sidcup, Kent.

THE aerial coupling coil L1 is isolated from chassis by C1, and transfers the signal to the inductively coupled band-pass filter unit. L2 (MW) and L3 (LW) are the primaries, tuned by VC1 section of the ganged condenser, while L4 (MW) and L5 (LW) are the secondaries tuned by VC2. L6 is the coupling winding of the unit, and additional coupling is, of course, effected across C2, which is also the AVC decoupling condenser for the grid circuit.

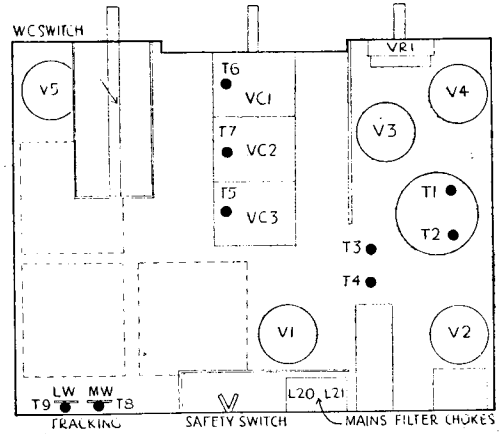
Signals are fed straight from the secondaries to the grid of V1, the heptode frequency changer. The triode section has a tuned grid circuit with R3, C3, the grid leak and condenser. The anode reaction coils are L7, L8, with a stabilising resistance R2. V1 is controlled from the AVC line, while permanent bias is derived from the cathode resistance R4 decoupled by C5. The screen is fed via R5 and R7 from the HT line.

The IF signals from V1 are coupled by IFT1 which comprises L11 and L12 to the IF amplifying valve V2. This is AVC controlled and permanently biased by R6 and C8. A second transformer IFT2 passes on the signal from V2 to the signal diode of the double diode triode second detector valve V3. R9 is the signal load resistance with R8, C10, and C11 the HF and IF filter network. The LF signal is coupled by C12 to the volume control VR1 which feeds the grid of the triode section of V3. This valve is biased by R10 decoupled by C13.

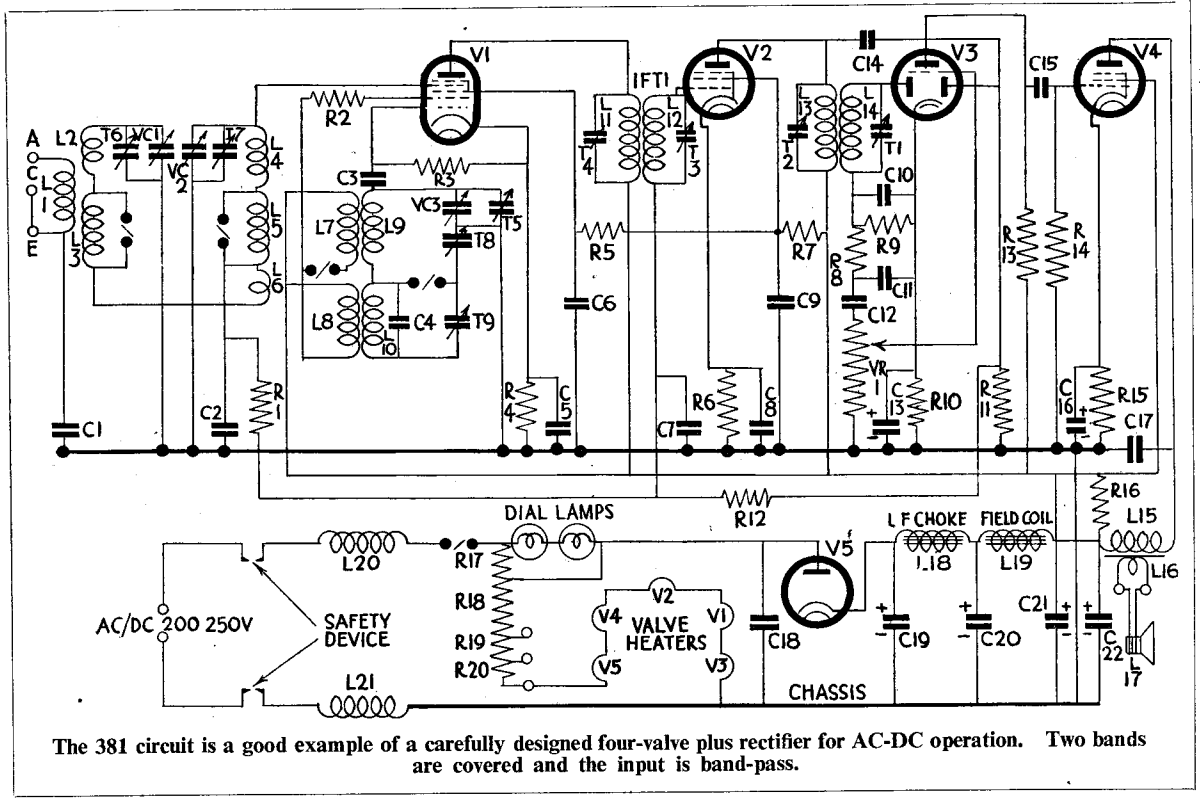
The AVC diode is fed from the anode of V2 via C14 which consists of a length of twisted wire. R11 is the AVC load resistance and the controlled valves are fed by the usual decoupling components R12, C7, R1, C2. The LF coupling between V3 and the output pentode valve V4 is of the resistance capacity type R13, C15, and R14 being the components concerned. The valve is biased by R15 decoupled by C16.

A permament degree of tone correction in the anode circuit of V4 is effected by C17. The usual output transformer L15, L16 couples the output of the valve to the low impedance energised moving coil loudspeaker.

The HT and LT supply circuits are obtained from the mains through filter chokes L20 and L21. C18 completes the filtering. The mains voltage dropping resistance R17-R20 is in the heater circuit except of the portion R17 which acts as a shunt to the scale lights and is also in the HT circuit V5 is the halfwave rectifier, while C19 is the reservoir condenser, L18 the smoothing choke and C20 the smoothing condenser. Additional smoothing is provided by the field coil L19 of the energised loudspeaker, C21 and C22.



This chassis layout diagram identifies the trimmers and other principal components. This old but popular K-B set is still in use in considerable numbers.



The 381 circuit is a good example of a carefully designed four-valve plus rectifier for AC-DC operation. Two bands are covered and the input is band-pass.

RESISTANCES

R	Ohms	R	Ohms
1	100,000	12	100,000
2	2,500	13	250,000
3	25,000	14	250,000
4	150	15	500
5	15,000	16	300
6	300	17	30
7	15,000	18	400
8	100,000	19	100
9	500,000	20	100
10	10,000	VR1	500,000
11	500,000		

CONDENSERS

C	Mfds	C	Mfds
1	.01	12	.02
2	.02	13	25
3	.0001	14*	9 mmfd
4*	9 mmfd	15	.02
5	.1	16	25
6	.5	17	.012
7	.1	18	.01
8	.1	19	8
9	1	20	8
10	.0001	21	4
11	.0001	22	4

* Twisted wire.

WINDINGS

L	Ohms	L	Ohms
1	15.5	12	75
2	5	13	75
3	20	14	75
4	5	15	500
5	20	16	1
6	.5	17	2
7	5	18	220
8	19	19	1,400
9	4	20	1.5
10	13	21	1.5
11	75		

GANGING

IF Circuits.—Switch to LW and turn tuning condenser and volume control to maximum. Inject a 130 kcs signal via a .1 mfd condenser to the control grid of V1 and earth socket. Adjust T1, T2, T3 and T4 in that order for maximum output, keeping the signal low to avoid AVC action.

MW Band.—Switch to MW and inject and tune in a 214-m signal. Adjust T5 to its peak. Then adjust T6 and T9 for maximum output.

Inject and tune in a 500-m signal and adjust T8 for maximum output, while rocking the gang.

LW Band.—Switch to LW; tune receiver to 1000 m and feed in a 1000-m signal. Check pointer setting. Inject and tune in a 1714-m signal and adjust T9 for maximum output while rocking gang. Adjust pointer of receiver to secure best compromise of accuracy between the 1000 m and 1714-m readings.

VALVE READINGS

V	Type	Electrode	Volts	Mas
1	15D1	Anode	125	5
		Screen	55	4.5
		OscAnode	120	5
2	9D2	Anode	140	8
		Screen	100	2
3	11D3	Anode	80	.1
4	7D3	Anode	140	35
		Screen	140	8
5	1D5	Cathode	229	65

Pilot lamps, 3.5v, .15 amp., MES.

MURPHY B24, B25

Continued from page v

the B25 the capacity of this component has been increased to .00035 mfd except in receivers prior to Serial No. 3800.

The remaining changes in the circuit lie in the values assigned to the trimming condensers, which have been altered to 10-50 mmfds in the case of the medium wave trimmers, and 10-80 mmfds for the long wave.

The on-off switch is incorporated with the volume control instead of the wavechange switch, and as a result, insufficient space remains below the chassis for the inter-valve transformer. The latter has accordingly been allotted a new position above the chassis, while the output transformer, which is smaller, has been transferred below.

Finally, it should be noted that the purple tracer lead from the tone control to one anode of the QP240 valve has been taken by a new route in order to prevent any risk of coupling with the yellow lead to the volume control; accordingly, it now runs round the condenser bank and behind V4 valveholder, and is kept as near to the chassis as possible.