

SUNBEAM "22" A.C.-D.C. SUPERHET (Cont.)

hand (looking from the back) terminal on the L.S. transformer panel.

Voltages between this terminal (1) and the remainder are :—

- (2) H.T. smoothed, 208 volts.
 - (3) Zero.
 - (4) V3 anode, 195 volts.
 - (5) H.T. unsmoothed, 230 volts.
- (2) and (4) are primary of output transformer, (3) and (5) are L.S. field.

Removing Chassis.—To test V3 it is necessary to remove the chassis.

Undo the control knobs (grub screw), unscrew the wave-change switch lever and remove the three holding screws from below.

General Notes.—The terminal strip on the smoothing choke has five tags shown in the lay-out diagram. The connections are :—

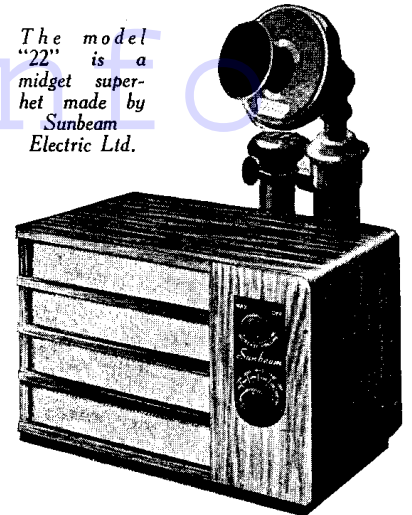
- A, V1 aux. grid.
 - B, H.T.+ smoothed.
 - C, H.T.+ unsmoothed.
 - D, I.F.T.1 secondary.
 - F, I.F.T.2 secondary.
- R3 is connected between D and F.

In handling this set, take care that the trimming condensers are not damaged.

Switch contacts are of the wiping type, and if these have to be cleaned the best method is to rotate the switch, wiping each end stud as it is revealed.

Replacing Chassis.—Replace the valves first, and then lay chassis inside cabinet. Replace holding screws, knobs and switch.

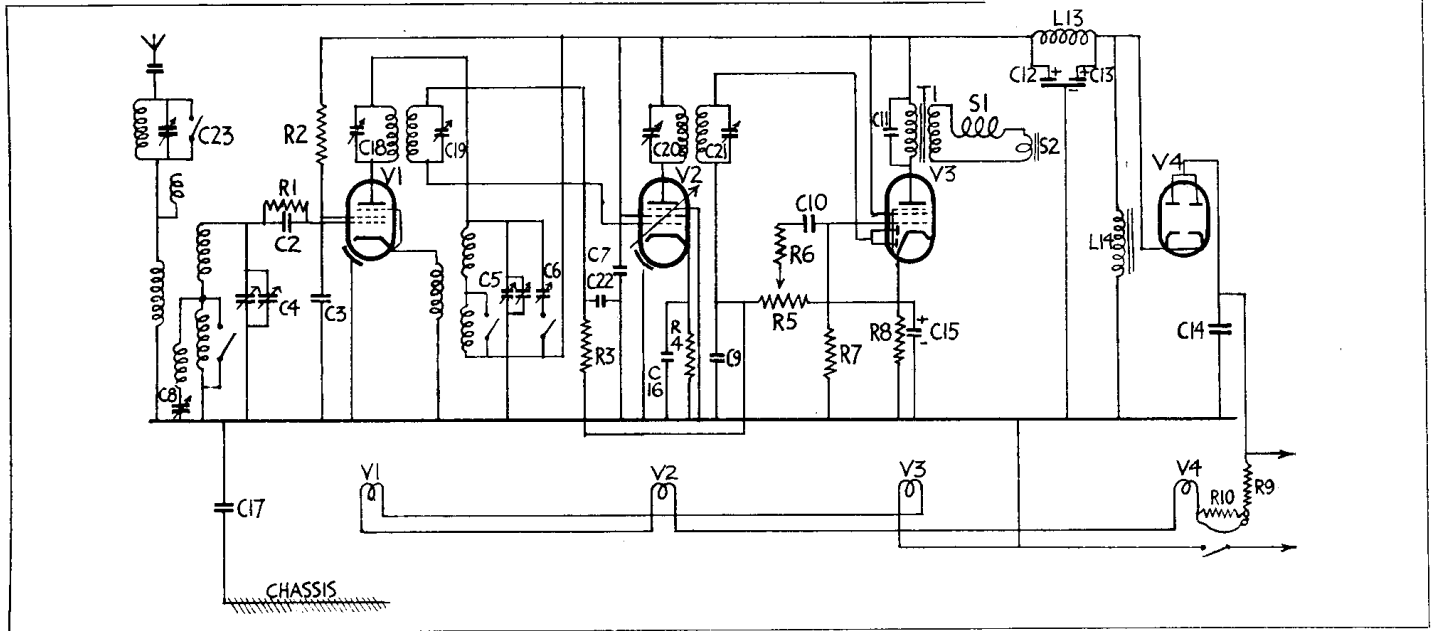
The model "22" is a midget superhet made by Sunbeam Electric Ltd.



Below is the three-valve plus rectifier superheterodyne circuit utilised in the "22". Actually there are five stages.

RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid leak	2 meg.
2	Voltage dropping to V1 aux. grid	.25 meg.
3	Decoupling A.V.C. to V2	1 meg.
4	V2 cathode bias	700
5	Var. volume control	.25 meg.
6	H.F. stopper	50,000
7	V3 grid leak	1 meg.
8	V3 cathode bias	140
9	Voltage drop to heater supply	520
10	Voltage adjustment	150
	L.S. field	10,000
	Primary of L.S. transformer	500
	Smoothing choke	500

CONDENSERS		
C.	Purpose.	Mfd.
2	V1 grid reservoir	.00025
3	V1 aux. grid by-pass	.1
7	V2 aux. grid by-pass	.1
9	Diode reservoir	.001
10	L.F. coupling to V3 grid	.006
11	Tone compensating V3 anode	.01
12	H.T. smoothing	4 el.
13	H.T. smoothing	8 el.
14	Mains by-pass	.1
15	V3 cathode by-pass	5 el.
16	V2 cathode by-pass	.1
17	Between common neg. and chassis	.01
22	Decoupling A.V.C. to V2	.1



TELSEN SIX-VALVE SUPERHET

Circuit.—The H.F. valve, AC/VP1 met. (V1) is preceded by a tuned secondary aerial transformer, which is iron cored. Bias is controlled from the full A.V.C. line and is limited by a cathode resistance. Coupling to the next valve is by a second iron-cored H.F. transformer, and tuning indication is effected by a meter in series with the anode lead.

The combined detector-oscillator valve, AC/TP met. (V2), is an H.F. pentode-triode and uses cathode injection. The coupling circuit is typical for this valve and includes a harmonic stopper (R7) in the grid circuit of the oscillator section.

This valve is also capable of superimposing the output from a gramophone pick-up on the I.F.

Coupling to the next valve is by band-pass I.F. transformer (I.F. 110 K.C.), and bias is by A.V.C. and cathode resistance.

The I.F. valve, AC/VP1 met. (V3), is

biased from a point of lower A.V.C. potential and by cathode resistance. It is followed by a second I.F. transformer.

A V914 (V4) high-voltage double-diode without a triode element is the detector. The A.V.C. diode is fed through a condenser from the anode of V3, and potentials are obtained from a load potentiometer consisting of R13, R14 and R15.

The L.F. diode anode is coupled to the output valve by a potentiometer volume control which forms the load, a condenser and a grid leak.

The output pentode, A.C.2 Pen (V5), has an H.F. stopper in the grid circuit. A tone compensating condenser is connected between grid and cathode, as well as a condenser between anode and cathode. Bias is obtained from a potentiometer (R23 and R24) in the cathode lead, the grid return being taken to the tapping. The full voltage drop across

R23 and R24 is the delay bias on the A.V.C. diode.

Mains equipment consists of transformer, full-wave R3 rectifier, with the L.S. field in the positive H.T. lead for smoothing with two 8-mfd. condensers.

Special Notes.—The pilot lamps can be removed by undoing the screw seen through the aperture in the bottom of the cabinet and lifting the bracket out complete.

Quick Tests.—Provided an H.F. signal is being applied to the set, the visual tuner always gives an indication as to whether or not the H.F., I.F. and detector stages are working. A defective output valve lowers the delay bias.

Voltages between the following terminals on the output transformer and chassis (no (Continued on page 156. For diagrams and component tables see opposite page.)

TELSEN SIX-VALVE SUPERHET (Cont.)



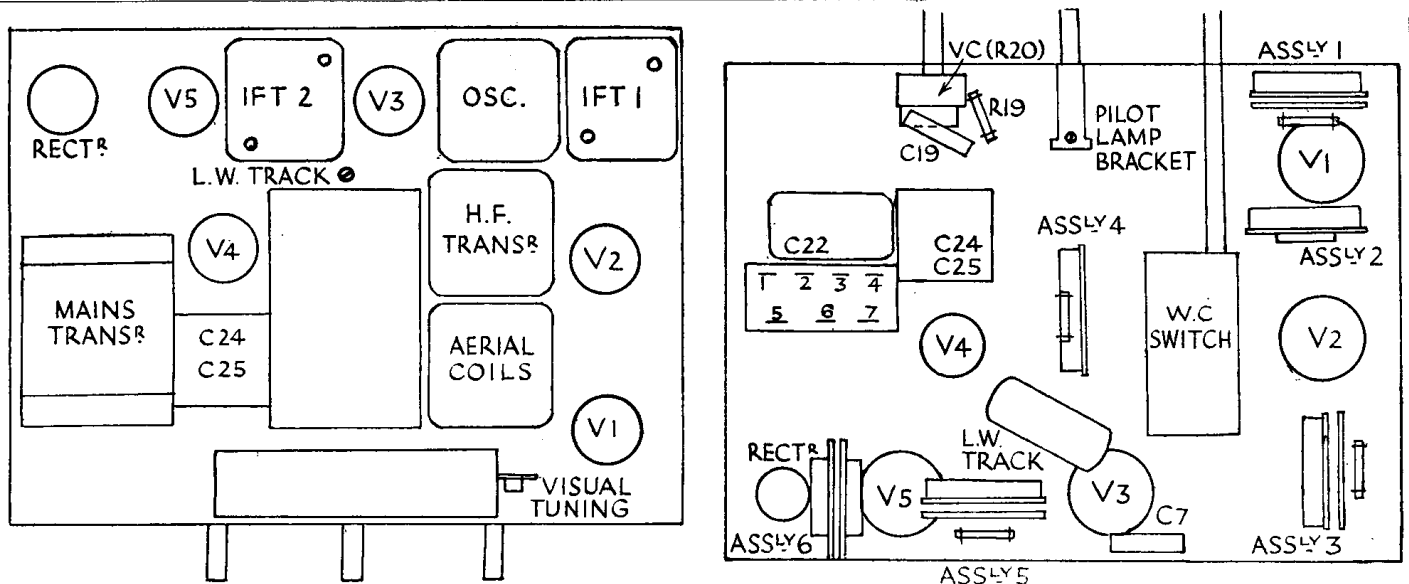
Here is one of the two forms in which Telsen Electric Ltd., marketed their six-valve mains superhet receiver.

CONDENSERS

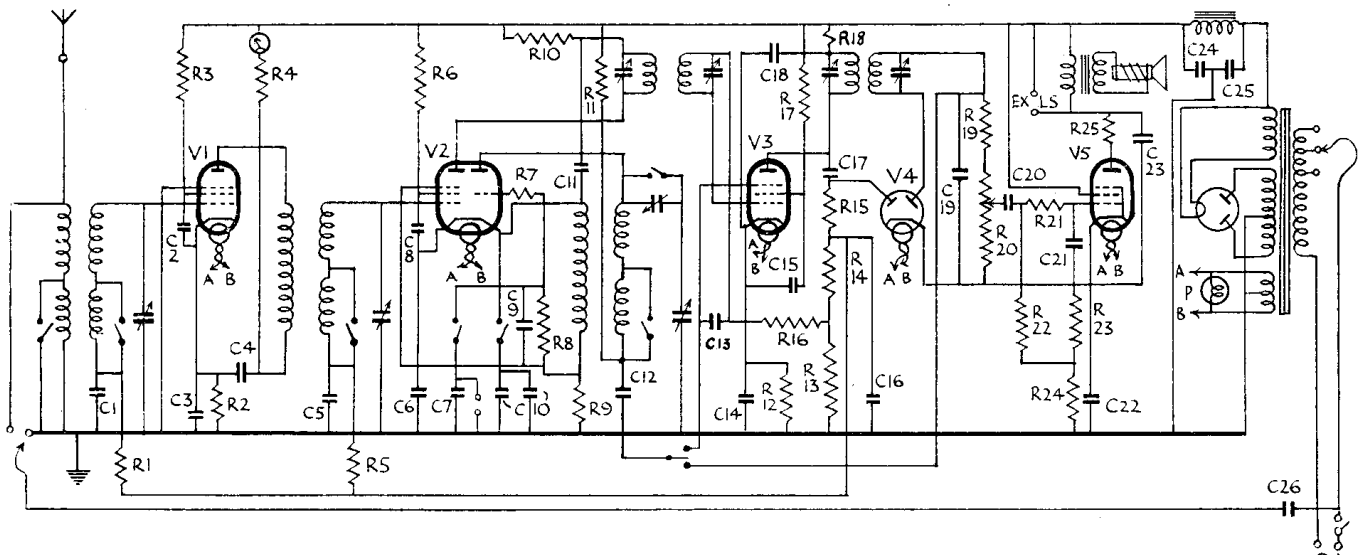
C.	Purpose.	Mfd.
1	Decoupling A.V.C. to V1	.1
2	V1 aux. grid by-pass	.1
3	V1 cathode by-pass	.1
4	V1 anode decoupling	.1
5	Decoupling A.V.C. to V2	.1
6	V2 cathode by-pass	.00085
7	Across P.U. leads	.003
8	V2 aux. grid by-pass	.1
9	V2 osc. grid	.0003
10	V2 cathode	.1 + .1
11	V2 anode decoupling	.1
12	V2 osc. anode decoupling	.1
13	V3 grid decoupling	.1
14	V3 cathode by-pass	.1
15	V3 aux. grid by-pass	.1
16	H.F. decoupling of A.V.C.	.0005
17	I.F. feed to A.V.C. diode	.0001
18	V3 anode decoupling	.1
19	H.F. by-pass from diode	.0002
20	L.F. coupling V4 to V5	.005
21	Tone compensating V5 grid	.0002
22	V5 cathode by-pass	2
23	Tone compensating V5 anode	.001
24	H.T. smoothing	8 el.
25	H.T. smoothing	8 el.
26	Mains aerial	.005

RESISTANCES

R.	Purpose.	Ohms.
1	Decoupling V1 grid from A.V.C. line	1 meg.
2	V1 cathode bias	300
3	Voltage dropping to V1 aux. grid	25,000
4	Decoupling V1 anode	10,000
5	Decoupling V2 grid from A.V.C. line	1 meg.
6	Voltage dropping to V2 aux. grid	25,000
7	Harmonic suppressor, V2 osc. grid	2,000
8	V2 osc. grid leak	50,000
9	V2 cathode bias	500
10	Decoupling V2 anode	5,000
11	Decoupling V2 osc. anode	50,000
12	V3 cathode bias	300
13	Part of A.V.C. bias ptr.	1 meg.
14	Part of A.V.C. bias ptr.	.5 meg.
15	Part of A.V.C. bias ptr.	.2 meg.
16	Decoupling A.V.C. to V3	1 meg.
17	Voltage dropping to V3 aux. grid	25,000
18	Decoupling V3 anode	5,000
19	H.F. stopper and part of diode load	100,000
20	Diode load and V.C. ptr.	.5 meg.
21	H.F. stopper V5 grid	200,000
22	V5 grid leak	.8 meg.
23	V5 cathode bias ptr.	150
24	V5 cathode bias ptr.	500
25	V5 anode stabiliser	150



The top "deck" layout (left) shows little space is wasted in the Telsen receiver. Details of the assemblies shown underneath the chassis (right) are given on page 156.



A signal-frequency amplifying valve before the triode-pentode frequency changer is one of the outstanding characteristics of the Telsen receiver.

