

The U.35 receiver by Sunbeam Electric, Ltd., can be connected without alteration to either A.C. or D.C. mains. Screen-grid, detector and pentode valves are employed in a straightforward circuit.

SUNBEAM A.C.-D.C. THREE

Circuit.—The H.F. valve, a variable-mu Tungfram SE2018 (V1), is preceded by an aerial transformer with tuned secondary. Coupling between the primary and secondary includes a small condenser.

The variable volume control acts by simultaneously damping the aerial coil and increasing the bias on the valve.

Coupling to the next valve is by tuned anode coil, the anode lead to V1 and the grid condenser lead for V2 being taken from a tapping on the M.W. section.

The detector valve, Tungfram R2018 (V2), works as a power grid detector with a very low value of grid leak. Gramophone reproduction is possible by means of a switch which connects the detector grid to the pick-up and disconnects it from the lead to the H.F. coupling condenser.

The output valve, PP2018 (V3), is a pen-

tode with cathode bias, and is tone compensated by a condenser between the anode and chassis.

Mains Equipment.—This consists of two sections: (1) H.T. supply; and (2) filament supply.

(1) Though the same components are actually in circuit for A.C. and for D.C., the operation is different. On A.C. the R2018 valve acts as a half-wave indirectly heated rectifier, with the H.T. + feed taken from the cathode (not connected to filament).

On D.C., as the valve is heated, it acts as a resistance of low value.

H.T. smoothing consists of a choke in the positive H.T. lead, with 16 mfd. and 4 mfd. electrolytic condensers. The L.S. field is connected directly across the unsmoothed H.T.

(2) Filament supply. The Tungfram valves are rated at 20 volt .18 amp., and a tapped resistance R9 has been included in the mains

(Continued on next page.)

VALVE READINGS

V.C. max. no reaction.

Valve.	Type.	Electrode.	Volts.	M.A.
V1	SE2018	anode ...	195	8.6
		screen ...	105	1.5
V2	R2018	anode ...	72	2.6
V3	PP2018	anode ...	190	18
		aux. grid ...	200	5.5

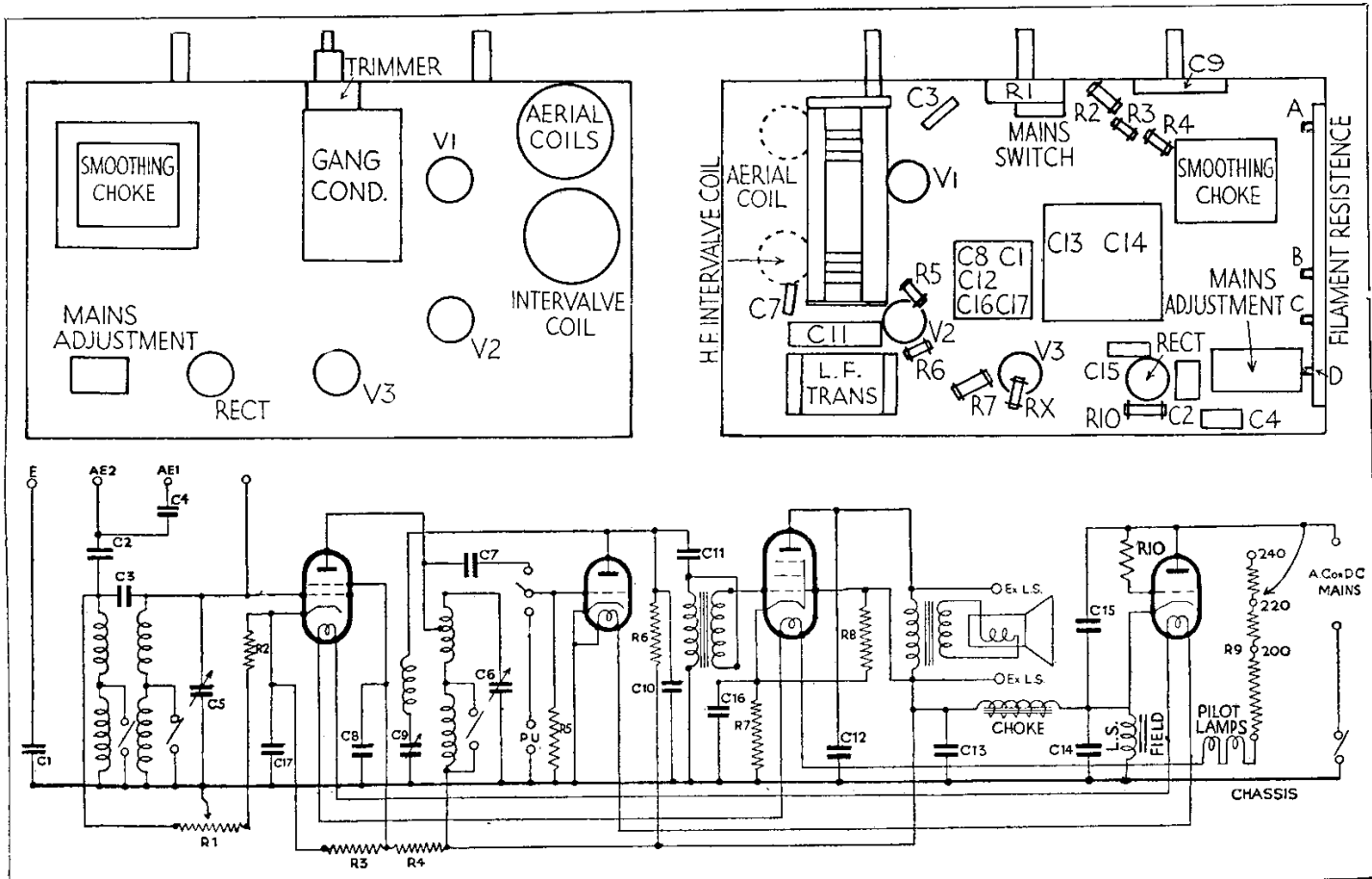
* Note that these voltages will vary with the supply on D.C. The above were taken on 245 A.C. with fuse connection in 240-250 v. socket.

CONDENSERS

C.	Purpose.	Mfd.
1	Between chassis and E. socket	.01
2	Aerial series ...	.0015
3	Coupling primary and secondary of aerial trans.	.00001
4	Aerial series ...	.0002
5	Tuning ...	.0005
6	Tuning ...	.0005
7	V2 grid ...	.0001
8	V1 screen ...	.1
9	Reaction condenser (var.)	.0003
10	V2 anode by-pass ...	.0003
11	L.F. feed to transformer	.25
12	Tone compensating anode V3	.01
13	Smoothing (electrolytic)	16 e.l.
14	Smoothing (electrolytic)	4 e.l.
15	Across rectifier ...	.004
16	V3 cathode ...	.5
17	V1 cathode ...	.1

RESISTANCES

R.	Purpose.	Ohms.
1	Var. volume control ...	10,000
2	V1 cathode bias limiting ...	150
3	Lower part of V1 screen ptr....	50,000
4	Upper part of V1 screen ptr....	25,000
5	V2 grid leak ...	.25 meg.
6	V2 anode coupling ...	50,000
7	V3 cathode bias... ..	900
8	V3 grid leak ...	2 meg.
9	See "General Notes."	
10	Link between "grid" and anode of rect.	260
—	L.S. field ...	7,500
—	Primary of output transformer	430
—	Smoothing choke ...	420



Above are the chassis diagrams of the Sunbeam U.35. For checking with "General Notes" the tappings on the filament resistance are lettered. Note from the circuit (below) that the pilot lamps are at H.T.

SUNBEAM UNIVERSAL RECEIVER (Cont.)

lead to provide the correct voltage. The filaments are wired in series in the following order from the resistance (+ on D.C.) :- V3, V1, Rect., V2.

Special Notes.—There are two pilot lamps, which are in series between the resistance and filaments.

CAUTION.—The full mains voltage exists between the holders and chassis when either a lamp or a valve is removed or has a disconnected filament.

Quick Tests.—Voltages between ter-

minals on L.S. transformer and chassis (make connection to screw or rivet as the coating is an insulator) looking from the back :-
 Right hand (1) H.T. + unsmoothed, 210 volts
 " " (2) V3 anode 186 "
 " " (3) blank, " "
 " " (4) H.T. smoothed, 195 "
 Left " (5) chassis.

Note that the L.S. field is between 1 and 5 (.7500 ohms).

Removing Chassis.—Remove knobs (grub screw) and unscrew locking nut and washer from wave-change switch spindle.

Remove one screw from underneath cabinet. Unsolder lead to internal aerial and slide the chassis out.

The L.S. leads need not be disconnected if the chassis has only to be examined.

General Notes.—The tapped filament resistance R9 at the end of the chassis gives the following readings when cold: A to B, 600 ohms; A to C, 670 ohms; A to D, 800 ohms. These are substantially higher when the resistance is warm.

In our model an additional resistance Rx, of .25 megohm, was connected between H.T. + and the cathode of V3.

Replacing Chassis.—Slide chassis into cabinet and replace the one screw underneath. Replace knobs and resolder the internal aerial.

BLUE SPOT CLASS B 4

Circuit.—The H.F. valve, VS2 (V1), is preceded by a single-tuned aerial circuit and is coupled to the next valve by a band-pass circuit. The variable- μ characteristic of the valve is used for volume control by means of a potentiometer across the grid-bias battery.

As bias for the driver valve is also taken from the same battery, the grid bias to V1 is decoupled. The feed to the first band-pass intervalve coil is by H.F. choke and condenser.

The detector valve, HL2 (V2), is a leaky grid type with reaction, and the usual H.F. filter is included in the anode circuit. Coupling to the driver valve is by "straight" transformer with a tone correction circuit consisting of a resistance and condenser in series across the primary.

The driver valve, 215P (V3), is coupled to the output valve by a typical class B input

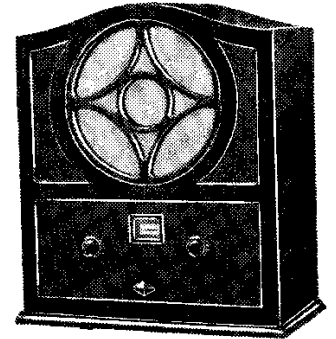
transformer. The anode circuit of this valve is decoupled, as is that of the detector.

The output valve, PM2B, operates at zero bias and is compensated for top note accentuation by condensers

Extra Speaker.—Provision is made for an external speaker, which can be used either with or without the internal one by means of reversing the L.S. plug supplied. This plug must be in the correct position.

The external speaker must be of the low-impedance type like that in the set, but if

(Continued on opposite page.)



The table model of the British Blue Spot Co.'s four-valve Class B receiver.

VALVE READINGS

Valve.	Type.	Electrode.	Volts.	M.A.
1	VS2	anode	116	1.6
		screen	70	
2	HL2	anode	75	2.1
3	215P	anode	75	2.1*
4	PM2B	each anode	120	

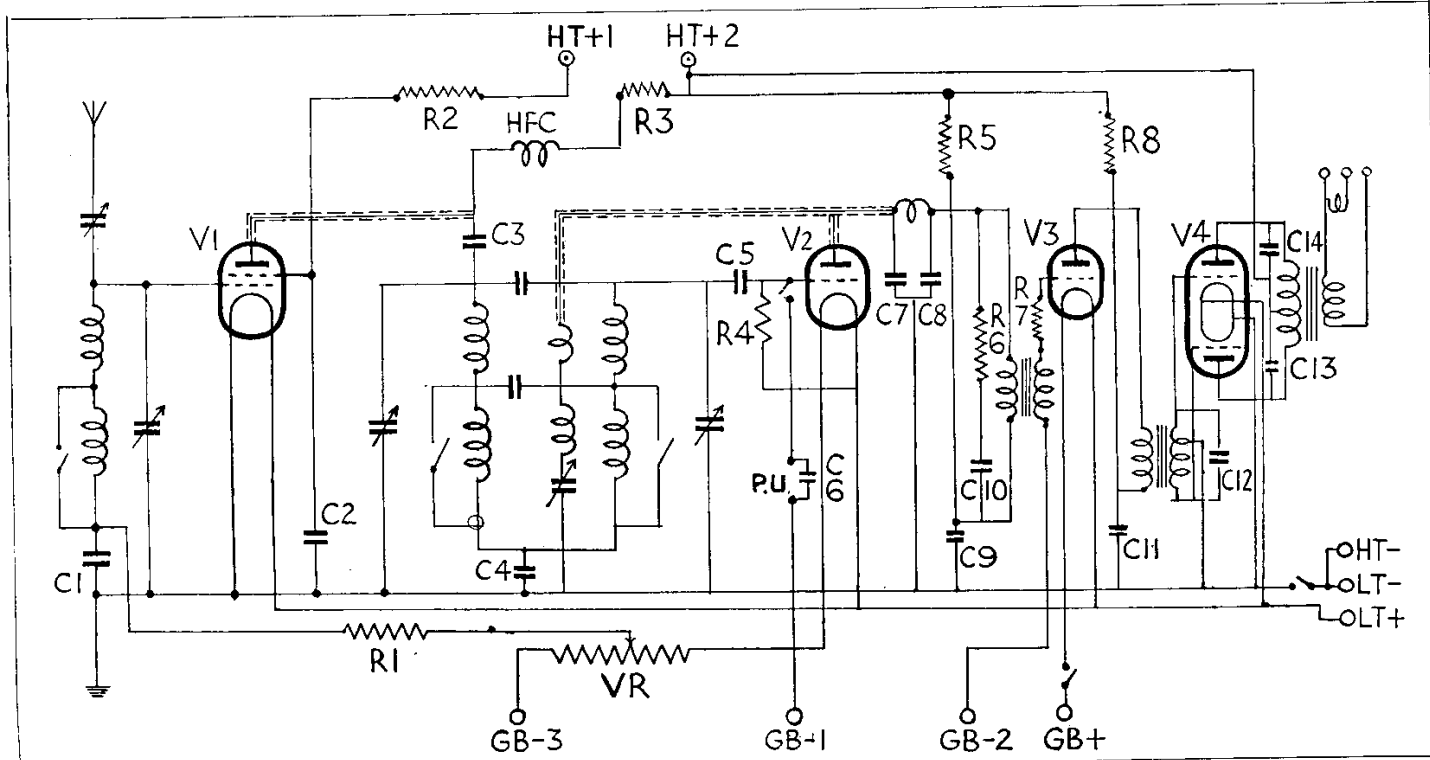
* With -4.5 v. bias.

RESISTANCES

R.	Purpose.	Ohms.
1	Decoupling bias for V1	5,000
2	Decoupling screen V1	5,000
3	Decoupling anode V1	5,000
4	V2 grid leak	1 meg.
5	Decoupling anode V2	5,000
6	Tone correction circuit anode V2	40,000
7	H.F. stopper grid V3	100,000 or 200,000
8	Decoupling anode V3	5,000
VR	Volume control (bias pot.)	25,000
	Primary of output transformer	160 each half approx.
	Primary of driver transformer	420
	Secondary of driver transformer	180 each half approx.
	Primary of L.F. transformer	1350
	Secondary of L.F. transformer	6,000

CONDENSERS

C	Purpose.	Mfd.
1	Decoupling bias V1	.1
2	Decoupling screen V1	.1
3	H.F. filter to 1st Band pass	.0001
4	Coupling band pass coils	.1
5	V2 grid condenser	.0002
6	Across P.U. jack	.005
7		.0001
8	H.F. filter anode V2	.0005
9	Decoupling anode V2	.1
10	Tone correction circuit anode V2	.01
11	Decoupling anode V3	.1
12	Between grids of V4 (stabiliser)	.02
13		.002
14	Tone correction anodes of V4	.002



A band-pass stage is placed between the screen-grid and detector valves in the Blue Spot Class B Four.