ULTRA "44" MAINS SUPERHET (Cont.)

Quick Tests.—Loosen speaker hood and take voltages between the outer terminals on the strip.

Left, red, H.T. smoothed 228 volts; right (black with white tracer), H.T. unsmoothed 400 volts. (These were taken on 230 v. A.C. mains in 230-250 tapping.)

Note that the only valve which has the anode terminal at the top of the bulb is the A.C./VP1.

Removing Chassis.—Remove knobs (grub screw). Remove four screws underneath and undo the two nuts from the bolts at the side of the speaker (not those on the speaker itself). A box spanner is necessary.

General Notes.—The resistance and condenser assemblies are mounted as follows. (See lay-out diagram.) Counting from the base in each case :—

Assembly 1 : R1, R3, R6, R5.
Assembly 2 : Shown on diagram.
Assembly 3 : R23, R19, C14, R8.
Assembly 4 : R18, C19, R21, C18.

In the circuit diagram in the August issue of the Ultra booklet, R1 was shown as being connected to the junction of R11 and R12 instead of to the low H.T. potential end of R11.

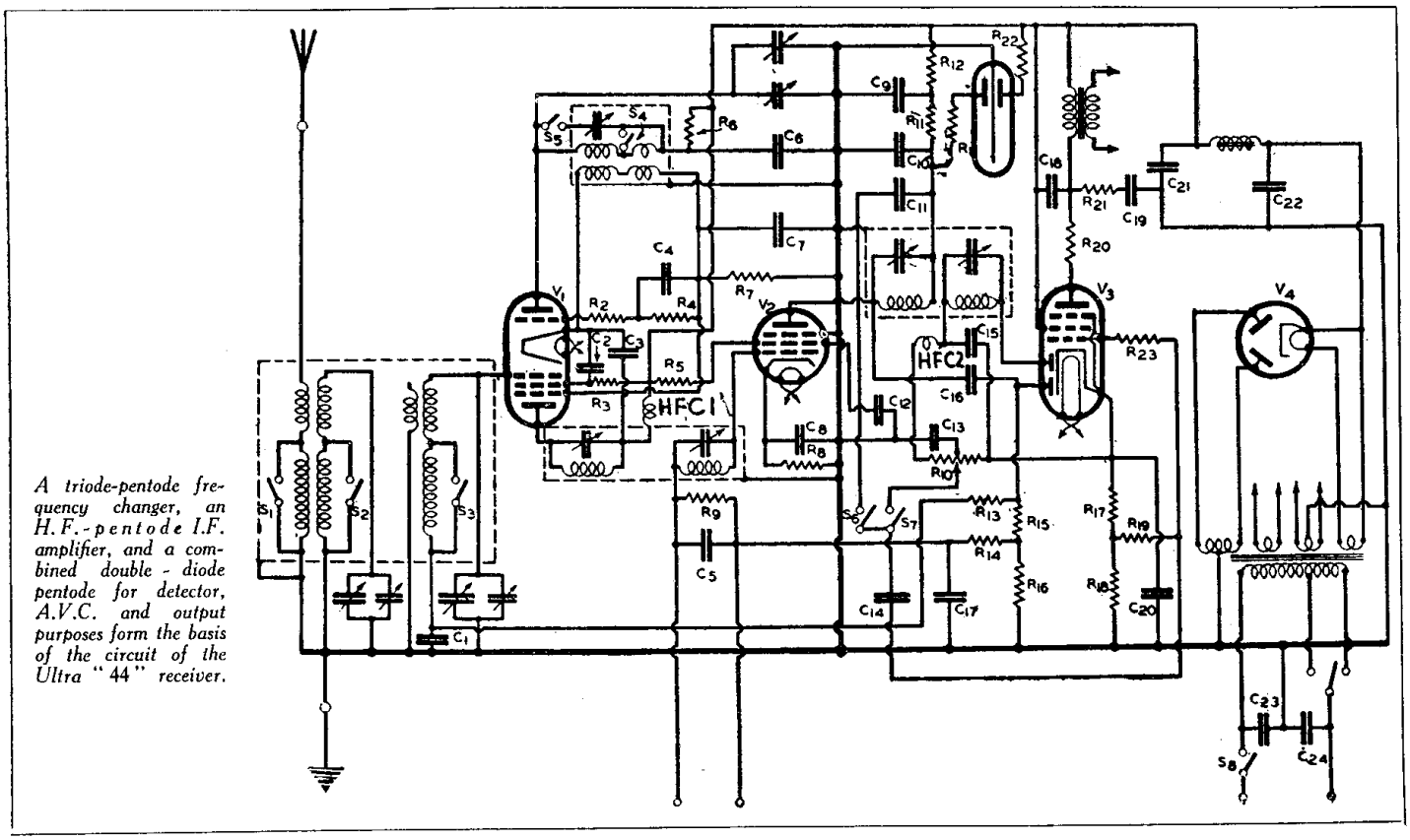
The connection from R1 on Assembly 1 is a yellow lead with a red tracer, which is linked with the cable going to the other side of the set to Assembly 2.

The leads in this set are not coded, but are made of different colours to facilitate tracing the circuit.

Mains transformer connections (see lettering on diagram) :—

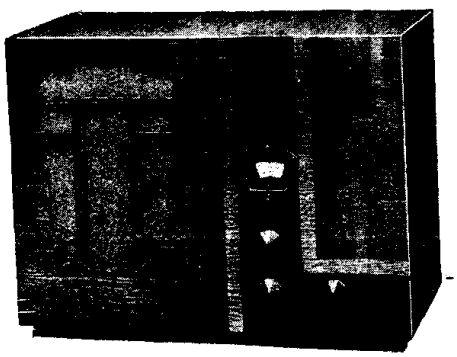
(1) and (2), set heaters.
(3) 230-250 mains tapping.
(5) 200-220 mains tapping.
(7) Mains 0 to switch.
(9) and (10) Rectifier heaters.
(11) and (12) Pilot lamps.
(8) and (4) Rectifier anodes.
(6) Centre tappings (to chassis).

Replacing Chassis.—Lay chassis inside cabinet, replace nuts on two bolts next the speaker. Replace the knobs and holding screws.



A triode-pentode frequency changer, an H.F.-pentode I.F. amplifier, and a combined double-diode pentode for detector, A.V.C. and output purposes form the basis of the circuit of the Ultra "44" receiver.

ALBA MODEL 21 BATTERY SET



An inexpensive "straight" three employing batteries, the Alba "21" is a product of A. J. Balcombe, Ltd.

Circuit.—The H.F. valve SP2 met. (V1) is preceded by a tuned secondary aerial transformer. Alternative aerial tappings are provided by means of resistances in series with the aerial lead, and a resistance is connected between the M.W. and L.W. windings on the primary. The grid return lead is taken to chassis.

Coupling to the next valve is by tuned secondary H.F. transformer with a reaction coil. The detector valve PM1HL met. (V2) operates as a leaky grid detector with zero bias provided by having two grid leaks, one connected to L.T.− and the other to L.T.+.

VALVE READINGS

[No reaction. New battery.]

Valve.	Type.	Electrode.	Volts.	Ma.
1	SP2 met (7)	anode ...	107	*1.8
		aux. grid ...	106	
2	PM1HL ...	anode ...	48	1
3	PM22A ...	anode ...	102	6.2
		aux. grid ...	116	1.8

* Inclusion of meter leads makes this valve unstable and a reading of 5 ma. will be recorded. Earth receiver or short-circuit A3 and E.

The coupling to the next valve is by "straight" transformer with anode decoupling.

The output pentode PM22A (V3) is tone-compensated by a condenser between the anode and chassis.

Special Notes.—Battery connections: Drydex S49, H.T.+, 108 volts; G.B.−, −3 volts.

The colours are: H.T.+, brown; G.B.−, blue; H.T.−, fawn.

Quick Tests.—These consist of routine battery and valve tests.

Removing Chassis.—Remove knobs (grub screw), undo four holding screws from underneath and lift chassis out. The L.S. leads are sufficiently long to allow the chassis to stand on its side.

General Notes.—The construction and wiring of this set are so simple that it is a fitting subject for the beginner.

(*Continued on next page.*)

ALBA MODEL 21 BATTERY SET (Continued)

The resistance R3 is mounted on the aerial coil-former (the can is easily pulled off).

Note that in the L.F. transformer the outer terminals are the ends of the secondary, while the inner ones are those of the primary.

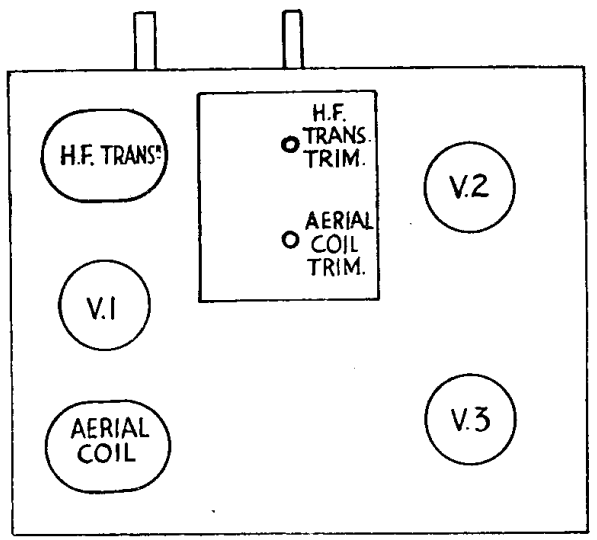
Replacing Chassis.—Lay chassis inside cabinet, replace holding screws and knobs.

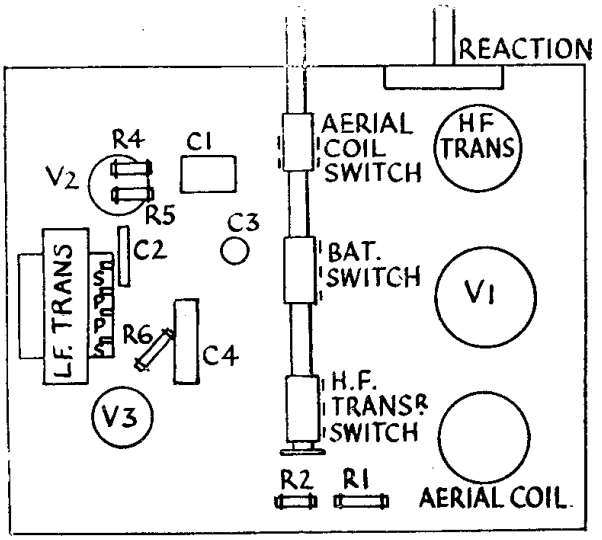
CONDENSERS

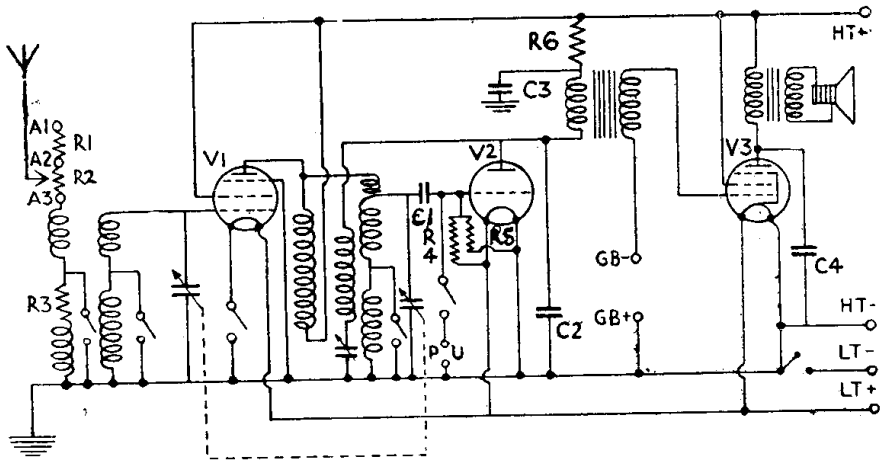
C.	Purpose.	Mfd.
1	V2 grid	.0001
2	V2 anode by-pass	.0001
3	V2 anode decoupling	.1
4	Tone compensating V3 anode...	.005

RESISTANCES

R.	Purpose.	Ohms.
1	Series with A1 tapping... ...	50,000
2	Series with A1 and A2 tappings.	25,000
3	Between M.W. and L.W. windings of aerial coil.	100,000
4	V2 grid leak	2 meg.
5	V2 grid leak	2 meg.
6	V2 anode decoupling	50,000







Above are the top (left) and underneath (right) chassis layout diagrams for the Alba model "21" receiver. The arrangement of components is logical and the receiver is a simple service proposition.

On the left is the circuit of the Alba "21" Resistances R1 and R2 used as aerial "tappings" and a double grid-leak arrangement connecting the grid of the detector to a filament centre-point are interesting features.

Frequency-Changer Circuits Explained

(*Continued from page 135.*)

internal arrangement of the electrodes. The circuit is the 1934 type and is usually accompanied by automatic volume control of the bias on the control grid of the S.G. or H.F. pentode section.

In the majority of cases the voltages and emissions of the triode and H.F. sections can be taken accurately without special precautions, but it is always advisable when examining the oscillator anode circuit to keep meter leads as short as possible and to make sure that the valve is oscillating.

When connecting a .01 or .1 mfd. condenser temporarily between either the anode and chassis or between the grid and chassis produces no change in anode current the valve is not oscillating and its emission should be tested independently of the set.

The H.F. pentode-triode is usually a nine-pin valve and contains two separate sets of elements as in the octode, but in the pentode-triode the two sets are entirely isolated from each other and reaction is obtained by

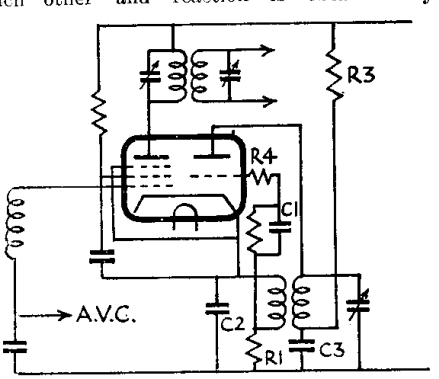


Fig. 3.—The circuit connections of a triode-pentode frequency changer.

coupling coil in the cathode lead as with the ordinary screen-grid valve. The conventional circuit is given in Fig. 3.

The resistance R4 is connected into the grid circuit of the oscillator to prevent the development of harmonics of the oscillator frequency, the condenser C2 and resistance R1 maintain a practically constant dynamic resistance of the circuit for different frequencies, and the tuned oscillator coil is connected in the anode circuit.

When called to attend to a superhet that is "dead" at the top end of either of the wave ranges the first component to suspect is the oscillator section of the frequency changer. Tolerances on these valves have to be very narrow and any serious loss of emission will immediately prevent oscillation and consequently heterodyning of the wanted carrier.

In such cases the only remedy is to fit a new valve and therefore it is wise for engineers always to carry one of each type of frequency changer.