ORR AW57 ALL-WAVE A.C. SUPERHET

CIRCUIT.—The input to V1, an octode frequency changer, is coupled to the aerial by an inductive-capacity coupled band-pass filter.

The input to the I.F. valve, V2, an H.F. pentode, is through an I.F. transformer tuned to 465 kc., and to V3, a double diode, through a further I.F. transformer. One diode of V3 is used to apply A.V.C. bias to V1 and V2 in the orthodox manner.

The rectified output of V3 passes to the L.F. amplifier V4, a triode, through a resistance and capacity network, and to the output pentode V5, through a further resistance capacity network incorporating a volume control. V5 is tone controlled by R17 and C23.

Mains equipment consists of transformer, full-wave indirectly heated rectifier, electrolytic condensers and the speaker field.

Special Notes.—The external speaker is connected on the low-resistance side of the output transformer and should have a resistance of about 2 ohms.

The dial lamp is a 6.2 volt .3 amp type and is readily removed.

Removing Chassis.—Remove five knobs, two on tuning spindle, all secured by grub screws and the four screws under-

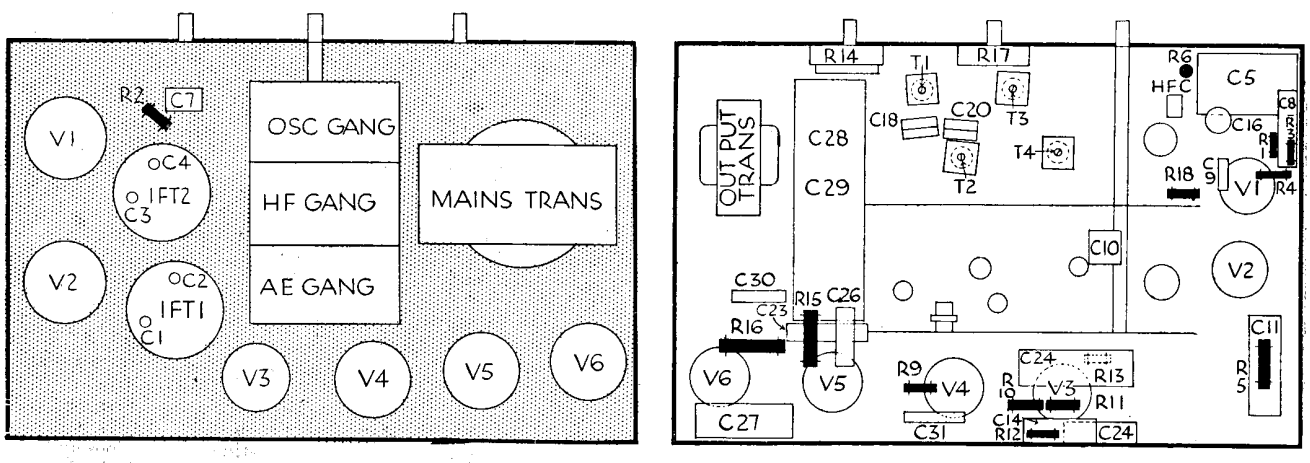
(*Continued on next page.*)

RESISTANCES

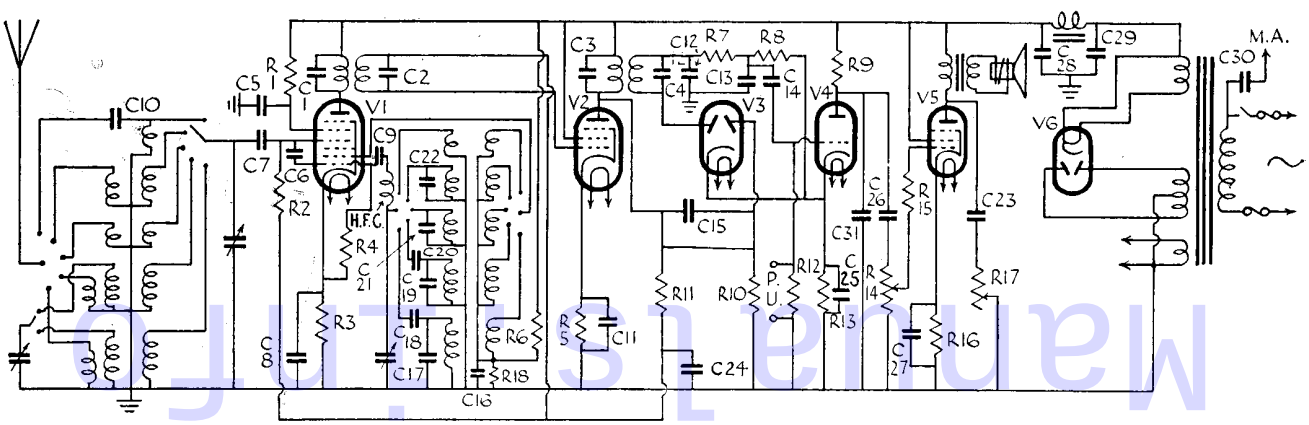
R.	Purpose.	Ohms.
1	V1 screen decoupling	40,000
2	V1 bias feed	300,000
3	V1 cathode bias	300
4	V1 triode grid leak	60,000
5	V2 cathode bias	140
6	Part V1 triode anode decoupling	40,000
7	H.F. filter	120,000
8	V3 demod. load	300,000
9	V4 anode feed	120,000
10	V3 A.V.C. diode feed	300,000
11	A.V.C. decoupling	300,000
12	V4 grid leak	1 meg.
13	V4 cathode bias	2,500
14	Volume control	250,000
15	V5 grid stopper	20,000
16	V5 cathode bias	500
17	Tone control	50,000
18	Part V1 triode anode decoupling	40,000

CONDENSERS

C.	Purpose.	Mfd
1	I.F. trimmer	.00014
2	I.F. trimmer	.00014
3	I.F. trimmer	.00014
4	I.F. trimmer	.00014
5	V1 screen decoupling	1
6	V1 control grid—oscillat r coupling	.0000017
7	H.F. coupling	.00015
8	V1 cathode decoupling	.1
9	Triode grid coupling	.00015
10	Short wave aerial coupli g	.00007
11	V2 cathode decoupling	.1
12	H.F. filter	.00015
13	H.F. filter	.00015
14	L.F. coupling	.05
15	A.V.C. diode coupling	.00015
16	V1 triode anode decoupling	.1
17	Long wave trimmer	.00004
18	Long wave padding	.00024
19	Medium wave trimmer	.00004
20	Medium wave padding	.00066
21	Short wave trimmer	.00004
22	Short wave trimmer	.0004
23	Tone control	.05
24	A.V.C. decoupling	.05
25	V4 cathode decoupling	25
26	L.F. coupling	.05
27	V5 cathode decoupling	25
28	H.T. smoothing	8
29	H.T. smoothing	8
30	Mains aerial	.001
31	Anode shunt	.001



Compact and logical construction is found in the Orr AW57. The "tinted" diagram shows the top and that on the right the underside. Note that all resistors are in solid black and condensers are in outline.



Five wavebands are covered by the AW57 and switched coils are included in both aerial and oscillator circuits. A feature is the use of separate diode and triode valves.

ORR AW57 SUPERHET (Continued)

neath the cabinet. The chassis will then withdraw far enough for the usual inspection and test without disconnecting the speaker leads.

On no account must the set be connected to the mains with the speaker disconnected, as the field forms part of the smoothing equipment.

CIRCUIT ALIGNMENT NOTES

I.F. Circuits. — Connect modulated oscillator, tuned to 465 kc., to the grid cap of V1, and output meter across external speaker terminals. Adjust C1, C2, C3 and C4 for maximum output.

Medium-wave Band.—Connect modulated oscillator, tuned to 300 metres to aerial and earth terminals, tune in signal and adjust T2 and the two trimmers on the gang condenser for maximum output.

Long-wave Band.—Tune modulated oscillator and set to 1,200 metres, and adjust T1 for maximum output.

Short-wave Bands.—(1) Tune oscillator and set to 75 metres and adjust T3 for maximum output.

(2) Tune set and oscillator to 30 metres and adjust T4 for maximum output.

QUICK TESTS

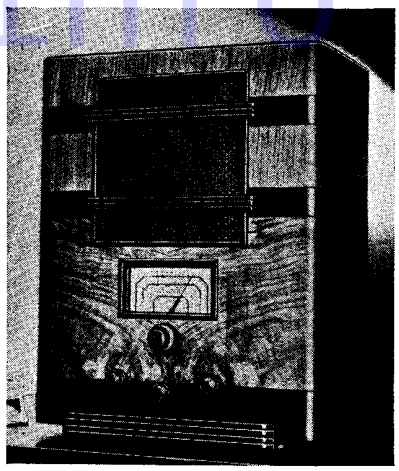
Quick tests are available on the terminal board of the speaker. Volts measured between this and the chassis should be :—

Red lead, unsmoothed H.T., 400 volts.
Black lead, smoothed H.T., 240 volts.

VALVE READINGS

No signal. Volume maximum and tone dull. 200 volt mains.

V.	Type.	Electrode.	Volts.	M/a.
1	FC4 (met.) (7)	anode ..	230	1.9
		osc. anode	65	1.5
		screen ..	75	4.4
2	VP4B (met.) (7)	anode ..	240	10
		aux. grid	230	4.2
3	2D4A (met.) (5)	diode ..	—	—
4	354V (met.) (5)	anode ..	75	1
5	Pen 4VA (7) ..	anode ..	220	32
		aux. grid	240	3
6	IW3 (4) .. (All Mullard)	filament..	400	—



The AW57 is made by United Manufacturers, Ltd., and distributed by Orr Radio, Ltd. It is a five-valve plus rectifier all-wave superhet.

Best Ways to Trace Causes of Noises

NOISES may occur either due to faults in a receiver or to external causes such as sparking switches, loose fuses, or interference-generating appliances.

Certain noises which "sound like a motor" or occur only at certain times can fairly safely be ascribed to external causes. The origin of others is not so easily decided.

If a hissing noise is noticeable even when the aerial is disconnected it is most likely introduced by a valve, especially if the set is a D.C. model.

When the noise ceases on disconnection of the aerial it cannot be assumed that it is being introduced from outside. The source may be a valve or component which only affects the output of the set when a transmission is being received.

A tuned circuit offers an impedance to only a limited band of alternating currents. To all other voltages it is, in effect, "shorted out."

Crackling noises are usually caused by a defective valve or component, or a faulty soldered connection. It is best not to waste a great deal of time trying to discover the fault by "jabbing" methods, but to connect a meter in the anode of each valve in turn, and watch for any change in current coinciding with the noise. This will localise the trouble.

Where crackling is incessant a rougher method to achieve the same end can be employed. The valves can be withdrawn one by one working from the H.F. end until the noise ceases.

If the symptoms continue right up to the last valve the fault is probably in some main lead of the circuit—for example, the H.T. positive and negative, and the filament or heater leads.

An excellent rough test—one which nearly everyone tries—is to slap the receiver smartly. Not everyone, however, realises just what can be learned from the results of this.

If the crackling increases in loudness or frequency, the cause is probably a faulty joint or bad connection. If it continues at much the same level, it is most likely due to a faulty component, such as a condenser, resistance or transformer.

A noise which occurs only when a receiver is working at fairly good volume is usually microphonic—that is, caused by electro-mechanical reaction introduced by some loose or vibrating part.

A microphonic valve is usually detectable by tapping gently and listening for the characteristic ringing noise. A variable condenser the vanes of which are thin enough to vibrate can have a similar effect.

Substitution of a new condenser is not always practicable, and it is best to mount the existing one "loosely" on rubber. An acoustic shield between speaker and condenser is sometimes effective.

SERVICE ENGINEER

ULTRA 26 A.C.-D.C. SUPERHET

CIRCUIT.—The signal is fed from the aerial through a band-pass circuit to the grid of V1, a triode pentode. This is coupled to the I.F. amplifier, V2, an H.F. pentode, through an I.F. transformer tuned to 456 kc.

V2 is coupled to the diode anodes of V3, a double-diode pentode, through a second I.F. transformer. One diode of V3 supplies A.V.C. in the orthodox manner.

The rectified signal of V3 is applied *via* a volume control to the controlled grid of the pentode portion of V3, and then to the speaker through an output transformer. V3 is compensated by R19 and C22 and tone controlled by C23.

Mains equipment consists of a half-wave indirectly heated rectifier, a voltage dropper, an L.F. choke and electrolytic condensers.

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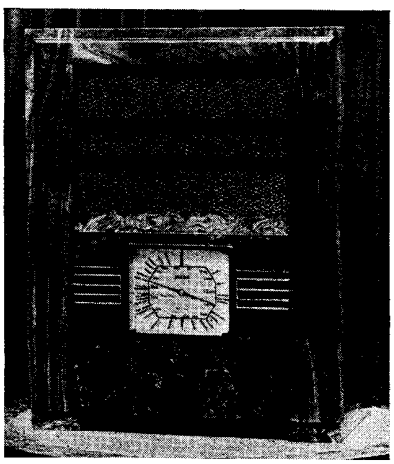

The model 26 made by Ultra Electric Ltd., is a three-valve plus rectifier superhet. As the circuit below shows, the design is orthodox. A triode-pentode frequency changer is followed by an I.F. amplifier and a combined double-diode and output pentode valve.

RESISTANCES

R.	Purpose.	Ohms.
1	V1 aux. grid	25,000
2	Harmonic suppressor	1,000
3	V1 grid bias	5,0000
4	V1 cathode bias	660
5	V1 anode	50,000
6	V2 aux. grid decoupling	30,000
7	V1 A.V.C. decoupling	250,000
8	V2 A.V.C. decoupling	2 meg.
9	A.V.C. diode load	500,000
10	A.V.C. diode load	1.5 meg.
11	Mains voltage adjuster	625
12	Pilot lamp shunt	80
13	V3 signal diode load	500,000
14	V3 cathode bias	110
15	Voltage dropper	220
16	Volume control	1 meg.
17	V3 grid stopper	1,000
18	V3 anode stopper	60
19	Tone filter	15,000

CONDENSERS

C.	Purpose.	Mfd.
1	Aerial blocking	.0004
2	Earth blocking	.1
3	V1 A.V.C. decoupling	.05
4	V1 decoupling	.1
5	V1 H.T. decoupling	.1
6	V1 oscillator coupling	.0002
7	V1 oscillator H.F. by-pass	.5
8	V1 oscillator anode decoupling.	.5
9	Long wave padder	.0003
10	V2 A.V.C. decoupling	.05
11	A.V.C. coupling condenser	.0002
12	V2 aux. grid decoupling	.5
13	H.F. filter	.0002
14	L.F. coupling	.01
15	Mains filter	.1
16	Pick-up blocking	.01
17	Pick-up blocking	.01
18	H.T. smoothing	8
19	V3 cathode bypass	50
20	V3 pentode filter	.001
21	H.T. smoothing	16
22	Tone filter	.01
23	Tone filter	.01