RGD Model 516 *Continued from opposite page*

The HT circuit is conventional and employs a full-wave rectifying valve V5, with smoothing effected by the field winding of the loudspeaker. C28 is the reservoir condenser and C27 the smoothing condenser.

GANGING

IF Circuits.—First check that the pointer, when vertical, lies directly over the three alignment dots on the scale. The alignment dots lie on a vertical diameter and are smaller than the station dots. If the alignment of the pointer is incorrect, rectify by slackening off the four screws which clamp the scale and adjust the scale until the dots coincide with the pointer.

Switch to medium or long waves and tune receiver to the bottom end of the scale. Adjust volume control to maximum and selectivity control to maximum selectivity, *i.e.*, position 2.

Inject a signal of 460 kc via a dummy aerial to the grid of the IF valve V3, and adjust T1 and T2 for maximum output.

Next inject the signal into the grid of V2 and adjust T3 and T4 for maximum output, keeping the output from the signal generator low. Check over the adjustments of T1 and T2 while the signal generator is connected to V2.

LW Band.—Switch to LW. Inject and tune in a signal of 800 m (375 kc), via the aerial socket and suitable dummy aerial. Adjust T5, T6 and T7 for maximum output. Inject and tune in a signal at 2,000 m (150 kc), and adjust T8 while rocking gang. Readjust T5 for maximum results.

MW Band.—Inject and tune in a signal of 220 m and adjust T9, T10, T11 for maximum output.

Inject and tune in a signal of 550 m and adjust T12 for maximum output while rocking gang. Readjust T9 for best results.

SW Band.—Inject and tune in a signal of 16.5 m (16.5 m is the last point marked on the left-hand short-wave scale). Adjust T13, T14 and T15 for maximum output.

Make sure that the oscillator trimmer T13 is adjusted at the setting which corresponds to the least trimmer capacity (higher oscillator frequency).

"Service Engineer" Index

AN index to "Service Engineer" reviews from November 1941 to the present issue will be found on page ii. A complete index from 1934 onwards was contained in the October 1941 issue.

INVICTA

650 Portable and B29P Transportable

Four-valve, two-waveband, battery superhet, incorporating AVC and automatic grid bias. A 90-volt HT battery is employed with the 650 and a 120-volt battery with the B29P. Made by Invicta Radio, Ltd, Parkhurst Road, London, N7.

THE MW and LW frame aerials are connected directly to the wave-change switch and thence to the VC1 section of the two-gang tuning condenser. Signals are passed via the blocking condenser C3 to the control grid of V1, the octode frequency changer. The grid of this valve is fed from the AVC line via R2, while R1, decoupled by C2, feeds the screening grid from the HT positive line. This supply line is decoupled by C1.

The oscillator section of V1 employs a tuned grid circuit with R3, C5, the grid leak and condenser. The oscillator anode is connected via the reaction windings direct to the HT line.

The IF signal from V1 is coupled by an iron dust cored intermediate frequency transformer IFT1. The inductances are set in the factory and have fixed capacities, C7, C8, across them.

The secondary of this transformer feeds directly into the grid of the IF amplifying pentode V2, which has AVC applied to it. The screening grid of the valve is fed from the HT line via R4 which is decoupled by C9.

A second IF transformer, IFT2, has variable inductance trimming and hands on the signal to the signal diode of the double-diode-triode V3. R7 is the signal load resistance while R5, C12 and C13 form the IF and HF filter network. From R7 the LF signal is passed, via C14, to the volume control R8, and thence to the grid of the triode section of V3.

The AVC diode of this valve is fed from the secondary of the IFT2 via C15, the AVC load resistance being R11. This is returned to the junction of the bias potentiometer R10, R12 in the HT negative line thus providing delay volts. This network is decoupled by C16.

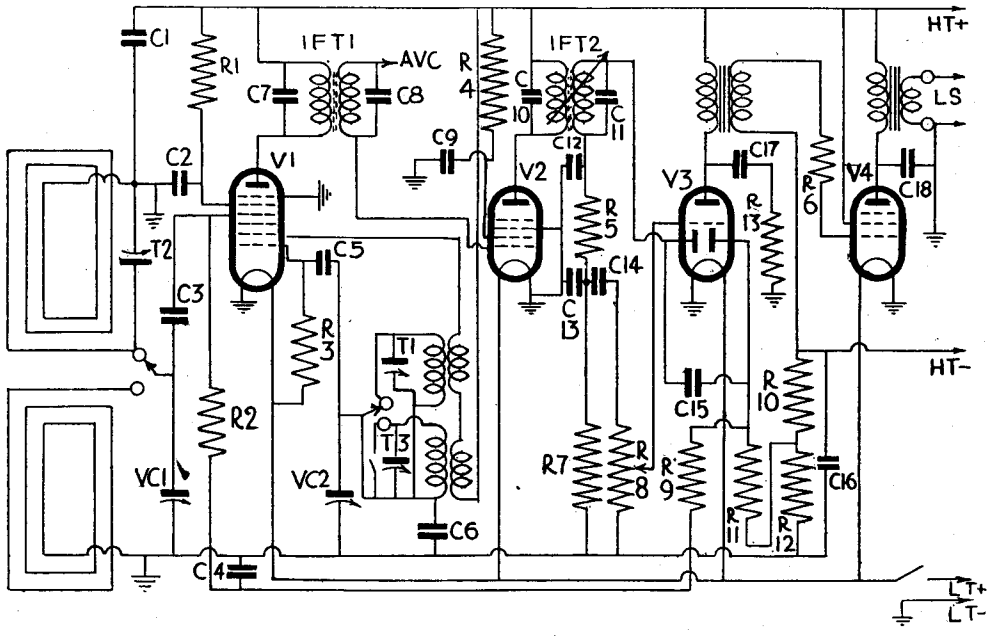
The primary of the intervalve transformer is connected directly in the anode circuit of V3, while C17 and R13 provide a degree of permanent tone correction. The secondary of the intervalve transformer connects via a grid stopper R6 to the grid of the pentode output valve V4, and to the maximum negative end of the bias network R10, R12.

C18 provides tone correction for the anode circuit of V4 which is coupled to the low impedance loudspeaker by an output transformer.

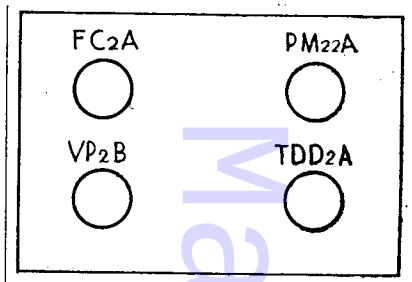
GANGING

IF Circuits.—Inject a 465 kc signal into the grid of V1 via a dummy aerial consisting of a .1 mfd condenser in series with the service oscillator lead and a 100,000-ohm resistance from V1 grid to earth. As already stated, the IFT1 trimmers are permanently set, but the trimmers of the IFT2 should be adjusted for maximum output. This transformer is located at the edge of the chassis next to the gang condenser.

MW Band.—First see that the pointer is horizontal when gang is fully closed. Adjust the service oscillator to 250 m and lay the service oscillator output lead near to the MW frame aerial.



The same four-valve battery circuit is used in both these Invicta models. A two band superhet arrangement is employed, with the input coils forming the frame aerial.



How the four valves are located on the Invicta chassis.

Switch the receiver to MW and set pointer to 250 m, and adjust the oscillator trimmer T1 for maximum output. This trimmer is the top one of the three trimmers located near the gang condenser. Then adjust T2 for maximum output; this trimmer is the bottom one of the three trimmers.

LW Band.—Switch receiver to LW. Inject and tune in a signal of 1,200 m and adjust T3 for maximum output. There is no trimmer across the LW frame aerial.

CONDENSERS

C		Mfd	C		Mfd.
1	..	1	10	..	.0001
2	..	.1	11	..	.0001
3	..	.00015	12	..	.00015
4	..	.1	13	..	.00015
5	..	.00015	14	..	.05
6	..	.000657	15	..	.00002
7	..	.0001	16	..	10
8	..	.0001	17	..	.01
9	..	.1	18	..	.005

VALVE READINGS

Readings taken with a 1,000-ohm-p-v meter. No signal input, volume control at maximum, with a 120-volts battery. (*Model* B29P)

V	Type	Electrode	Volts.	Mas
1	FC2A	Anode	115	.5
	Mullard	Osc. Anode	115	2.5
		Screen	45	.75
2	VP2B	Anode	115	1.5
		Screen	45	.5
3	TDD2A	Anode	110	2.5
4	PM22A	Anode	110	3.0
		Screen	115	.5

RESISTANCES

R		Ohms	R		Ohms
1*	..	10,000	8	..	1 meg
2	..	.25 meg.	9	..	1 meg
3	..	40,000	10*	..	150
4	..	100,000	11	..	1 meg
5	..	60,000	12	..	100
6	..	100,000	13	..	20,000
7	..	.5 meg			

*In Model B29P, R1 is increased to 40,000 ohms, and R10 to 330 ohms, for use with 120-volts battery.