

INVICTA CW3B-A.C. ALL-WAVE STRAIGHT THREE

CIRCUIT.—A three-valve "straight" A.C. mains receiver for operation on three wavebands—long, medium and short. The aerial is inductively coupled to V1, an H.F. pentode. The output passes to V2, an H.F. pentode, through a coil, reaction being employed in the orthodox manner. The L.F. output is fed to V3, a pentode, through a resistance and capacity stage, and then to the speaker through a matched output transformer.



The Invicta CW3B/A.C. is made by Orr Radio, Ltd., and distributed by United Radio Manufacturers, Ltd. It is a simple form of three-valve plus rectifier A.C. "straight" set but covers an additional short-wave band.

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

Special Notes.—The dial lamp is rated at 6.2 volts .3 amp., and is easily removed. The external speaker is connected on the low resistance side of the output transformer, and should have a speech coil impedance of from 1 to 6 ohms.

In some models of this receiver, C3, the cathode bias shunt for V1 will be .1 mfd. If the volume control appears noisy, this should be replaced by a 25 mfd. electrolytic condenser, 25 volt working

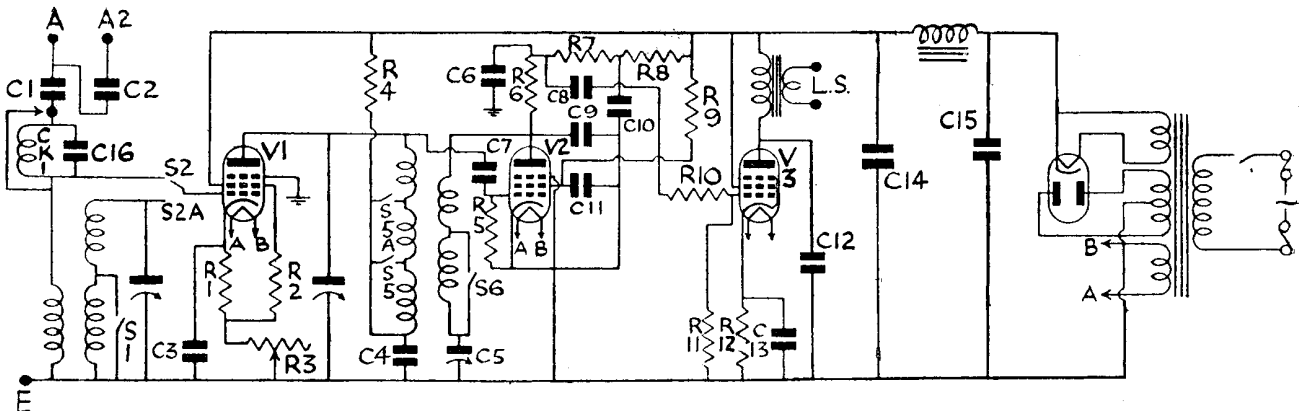
(Continued on opposite page.)

CONDENSERS

C.	Purpose.	Mfd.
1	Series aerial00015
2	Series aerial00007
3	V1 cathode bias shunt ...	25
4	V1 anode decoupling ...	1
5	Reaction0005
6	H.F. by-pass0003
7	V2 grid... ..	.00015
8	L.F. coupling01
9	H.F. by-pass00015
10	V2 anode decoupling1
11	V2 screen decoupling... ..	.1
12	Pentode compensating005
13	V3 cathode bias shunt ...	25
14	H.T. smoothing ...	8
15	H.T. smoothing ...	8
16	Wave trap00015

RESISTANCES

R.	Purpose.	Ohms.
1	V1 cathode bias ...	140
2	V1 screen decoupling ...	50,000
3	Volume control ...	10,000
4	V1 anode decoupling... ..	11,000
5	V2 grid leak ...	1 meg.
6	V2 anode feed... ..	11,000
7	H.F. filter ...	120,000
8	V2 anode decoupling... ..	60,000
9	V2 screen decoupling... ..	500,000
10	V3 grid stopper ...	300,000
11	V3 grid leak ...	1 meg.
12	V3 cathode bias ...	140



Three pentodes are employed in an orthodox H.F.-detector-L.F. arrangement in the Invicta receiver. A circuit modification which may be found is mentioned under "Special Notes."

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INVICTA CW3B-A.C. ALL-WAVE THREE (Contd.)

Removing Chassis.—Remove the four knobs from the front of the cabinet and four bolts from underneath. The chassis will then slide out of the cabinet far enough for the usual inspection and test without disconnecting the speaker leads.

ALIGNMENT NOTES

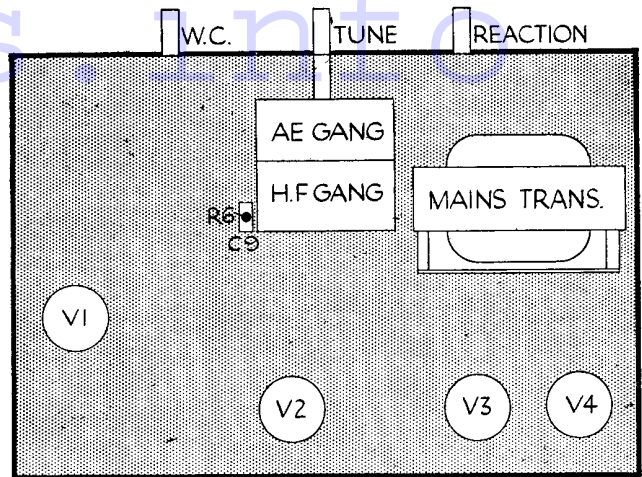
Connect a modulated oscillator to the aerial and earth terminals and an output meter across the speaker.

Tune receiver and oscillator to 200 metres and adjust T1 and T2 for maximum reading on output metre.

Tune receiver and oscillator to 500 metres and repeat.

Repeat the procedure for check.

The "tinted" diagram on the right shows how the components are arranged on the top of the Invicta chassis. The set is a straightforward job from a service point of view.



QUICK TESTS

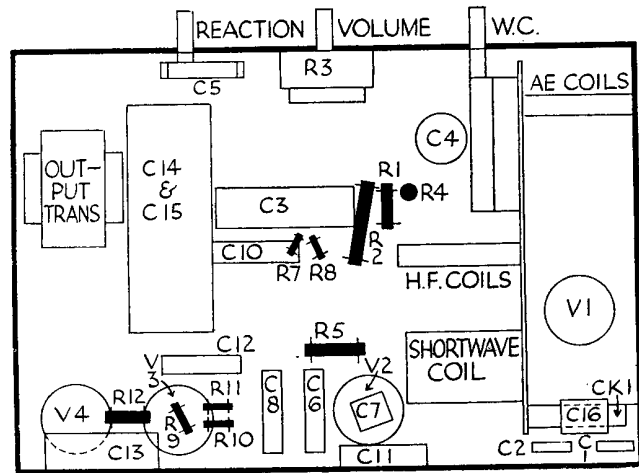
Quick tests are available on this model on the terminal strip on the speaker. Volts measured between this and the chassis should be:—
Red lead, 410 volts, unsmoothed H.T.
Black lead, 230 volts, smoothed H.T.

VALVE READINGS

No signal. No reaction. Volume at maximum 200 v. mains.

V.	Type.	Electrode.	Volts.	Ma.
1	VP4B(7)Met.	anode ...	230	10.5
		screen ...	50	4.5
2	SP4B(7)Met.	anode ...	30	.05
		screen ...	40	1.2
3	Pen4VP (7)...	anode ...	225	34
		screen ...	210	4
4	IW3 (4) ... (All Mullard)	filament ...	420	—

This diagram enables the small components mounted inside the Invicta chassis to be identified easily. Most of the parts are in their logical positions.



Constructing a Television Receiver

WHETHER the inception of high-definition broadcasting will lead to a new interest in home construction cannot be forecast. But one thing is certain: radio service engineers will have to become familiar with television receivers and be able to service, maintain and operate them.

On the principle that one learns best through practice, many radio men will wish to make up receivers. In any case, all of them will need to know the general, theoretical and practical basis of the design of a modern television set.

"Television Reception," a book by Manfred von Ardenne, just published by Chapman and Hall, Ltd., deals comprehensively with the construction and operation of a cathode ray receiver for ultra-short wave television broadcasting, and therefore meets a very real need.

Baron von Ardenne is himself a television inventor of international renown. His book has been translated from the German by Mr. O. S. Puckle, A.M.I.E.E., of the Research Department of A. C. Cossor, Ltd. Mr. Puckle, who, incidentally, in conjunction with Mr. L. H. Bedford, has developed a unique type of television receiver, has added to

the book details of the Baird and E.M.I. transmissions.

The book begins with a review of the problem—what the television receiver has to achieve. This contains data on the Berlin Witzleben transmissions and also the specifications of the wave forms of the Baird and E.M.I. transmissions.

Chapter 2 deals with the cathode-ray tube in a way which will afford an understanding of the nature, construction and operation of the various types.

The volume then proceeds with the actual details of a television receiver, successive chapters dealing respectively with the mains supply apparatus, the time bases, an amplitude filter for separating the synchronising impulses, the detector, the picture receiver, and the sound receiver. Then comes a description of the results obtained.

These chapters contain circuits, lists of components and valves (British types) and brief references to practical design.

The original receiver was for 180-line reception, but it may be possible to introduce modifications which will enable the Baird and E.M.I. transmissions to be received.

Whether or not this will be possible

remains to be seen, but in any event the book is a valuable guide to many of the problems that will be experienced in television reception here.

The price of the book is 10s. 6d., and it is available at 11s., post free, from the Technical Book Department, Odhams Press, Ltd., 85, Long Acre, London, W.C.2.

THE well-equipped service bench should contain, amongst other things, a panel having a number of mains sockets of various types mounted upon it, for the rapid testing of sets using various types of plug and socket, such as the normal bayonet cap socket, the standard 5-amp socket and the normal "power" socket.

For safety's sake, it is well worth while to use one socket solely for mounting a small monitor lamp which will serve to show when the power at the bench is on or off. When work at the bench is finished his lamp will serve to show that the power is still on and probably that the soldering iron is still in use. This will reduce the possibility of leaving the soldering iron on all night and causing possible damage.