

'TRADER' SERVICE SHEET

221

INVICTA 390 3-BAND BATTERY SUPERHET

A SHORT-WAVE range of 16.5-52 metres is covered by the Invicta 390 3-valve 3-band battery operated receiver...

CIRCUIT DESCRIPTION

Aerial input via series condenser C1 to coupling coils L2 (S.W.), L4 (M.W.) and via choke coil L1 L6 (L.W.)...

triode section. Provision for connection of gramophone pick-up across R8. I.F. filtering by R6, C13, C18.

Second diode of V2, coupled by C15, provides D.C. potential which is developed across load resistance R11 and fed back through decoupling circuit as G.B. to F.C. and I.F. valves...

DISMANTLING THE SET

Removing Chassis.—To remove the chassis from the cabinet, first remove the four control knobs (recessed grub screws) and then the four bolts (with rubber and metal washers) holding the chassis to the platform...

When replacing, do not forget to replace the rubber washers between the chassis and its platform, and the felt washers between the knobs and the cabinet front.

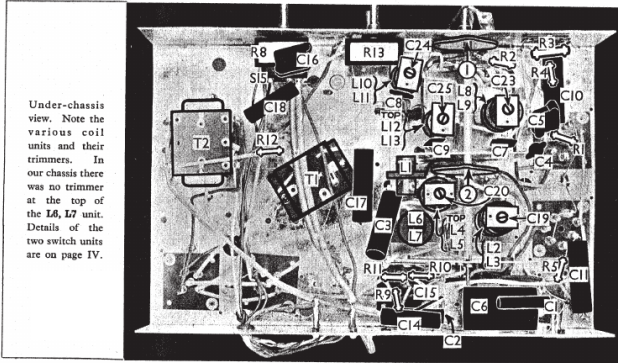
the dot is in the positions indicated on the tuning scale.

To free the chassis entirely, unsolder the speaker leads.

Removing Speaker.—If it is desired to remove the speaker from the cabinet, remove the nuts from the four screws holding it to the sub-baffle and wires replacing, see that the terminal panel is at the top.

COMPONENTS AND VALUES

Table with columns for CONDENSERS, RESISTANCES, and OTHER COMPONENTS, listing various parts like C1, C2, R1, R2, etc. with their values.



Under-chassis view. Note the various coil units and their trimmers. In our chassis there was no trimmer at the L6, L7 unit.

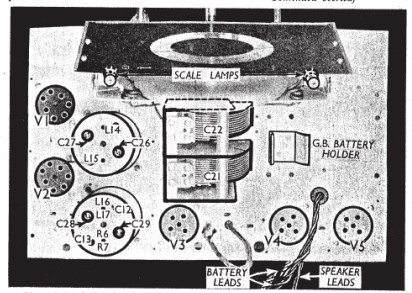
Table of RESISTANCES and OTHER COMPONENTS with values in ohms, kilohms, and megohms.

receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input, the receiver being in the quietest state.

Valves were measured on the 1,200 V scale of an Avometer, the chassis being negative.

GENERAL NOTES

Switches—S1-S14 are the waveband and radio muting (on gram.) switches, in two ganged rotary units beneath the chassis. These are indicated by numbers in circles and arrows in our under-chassis view, and are shown in detail in separate diagrams on p. IV, where they are seen



Plan view of the chassis. Note the extra components in the L16, L17 unit.

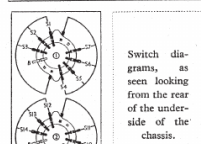
VALVE ANALYSIS

Valve voltages and currents given in the table (col. 2) are those measured in our receiver when it was operating with a new 120 V.T. battery reading 128 V. on load, and the green plug inserted into the 6 V socket of a G.B. battery. The

INVICTA 390—Continued

looking from the rear of the underside of the chassis. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open, and C, closed.

Table with columns for Switch, S.W., M.W., L.W., and Gram., showing open/closed states for various switches.



Switch diagrams, as seen looking from the rear of the underside of the chassis.

Matching V4 and V5.—The pair of valves supplied are matched. When fitting replacements, rough matching should be carried out. Insert a millimeter in the negative H.T. lead. Remove all valves, but leave batteries connected. Insert one PM2A in V5 socket, note meter reading and remove valve. Insert another PM2A in same socket and again note reading. Select a pair of valves which give readings with a ratio less than 2 to 1.

Valve V2.—The VP2B is a hexode, used in this set as an I.F. pentode amplifier, by connecting the two screening grids together. A diagram of the base connections, looking at the underside of the valve, is given on this page.

Chassis Divergence.—In the makers' diagram there is an aerial circuit L.W. trimmer, in parallel with L7, and mounted on the L6, L7 coil unit. This does not occur in our chassis.

M.W. Stages.—Connect signal generator to I.P. Stages.—Connect signal generator to I.P. Stages.—Connect signal generator to I.P. Stages.

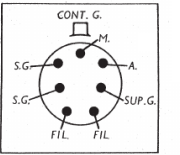
Choke in Portable Burnt Out.—It was only by chance that we 'four' out the cause of the repeated burnout of our R.F. choke in a small Burnout portable. A clue was provided when the customer mentioned that he obtained signals by holding up the screened top connector on the valve to which the choke was connected.

Assuming that the trouble was caused by insufficient coupling of the band-pass coils, we tried capacity coupling by means of a 0.0001 µf condenser at a convenient point on the Lisen condenser and achieved the desired result.—E. S. CHILTERN.

Faults in Lisen 8001 and 8014.—Two or three ago Lisen put on the market a 2-valve alarm set, the 8001, and later another, the 8014. We found these sets very popular and many were sold, but from time to time they have needed service and I give below the cases of faults experienced.

Microphonic howl will usually be found to be due to the detector valve, grid leak or grid condenser, while weak output and no reaction is caused by the reaction coil being out of position, which shows as a small green spot on the winding, adjacent to the soldering tags.

After some trouble it was found that the lead from the cathode of the heptode was rather long and passed near the oscillator anode coupling condenser (C1, TRADER Service Sheet). On spacing this lead from the condenser the receiver became quite normal, but each time this lead was deliberately misplaced the same symptoms were again experienced.—A. L. WHEELER, GREAT MISSENDEN.



Base and top cap connections of the VP2B hexode, looking at the underside of the base.

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M.W.—Switch set to L.W., feed in a 1,200 m. signal, set pointer to 1,200 m. on scale, and adjust C25 for maximum output. If a trimmer is fitted to the L6, L7 unit, adjust this next.

S.W.—Switch set to S.W., feed in a 30 m. signal, set pointer to 30 m. on scale, and adjust C25, then C19, for maximum output. Check on 16.5 m.

MAINTENANCE PROBLEMS

SENSITIVE Bush Superhets

It was the complaint with some Bush battery superhets of the 1935-6 vintage—a tendency which we have noticed on some other new models.

Examination of the valves, valve readings and circuit values revealed no fault, and re-trimming and re-aligning failed to effect an improvement. It was observed, however, that tapping the aerial direct on to the tuning coils after the band-pass filter made an improvement greater than could reasonably be anticipated.

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This connector is very shallow and if it should become loose in transit it can, and in this case did, lift at such an angle that the anode connector touched the metalising of the valve, thus placing the H.T. voltage across the choke winding.—J. H. E. WATTS, SOMERTON.

High Background in Philco 444

PHILCO 444 A.C. People's Set gave an excessive background noise on the L.W. band, especially above 1,800 m., and curiously enough, it seemed that it was functioning as a short-wave set when tuned to this part of the dial, as the sparking plugs of passing cars caused great interference.

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