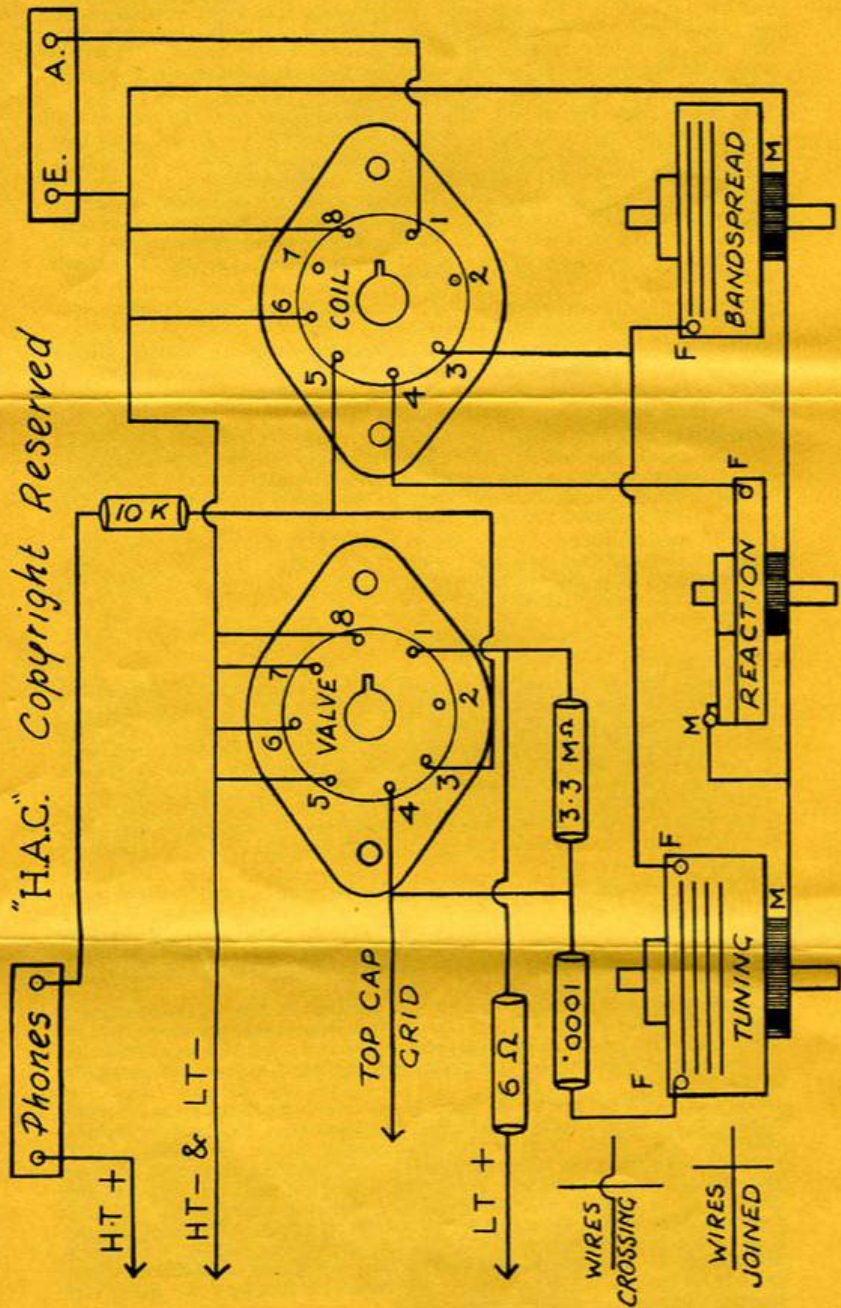


"H.A.C." Copyright Reserved



H.A.C.

Short Wave

Receivers ..

Instructions for Constructing
And Operating I-Valve Model
"DX." (Mark 2)

Sole Manufacturers:
"H.A.C." SHORT-WAVE PRODUCTS
P.O. BOX 16, EAST GRINSTEAD, SUSSEX, RH19 3SN

CONSTRUCTION

The "H.A.C." One-valve Short Wave receiver is very easy to construct, and if the following points are carefully adhered to, no difficulty whatsoever should be encountered either in the construction or operation.

Firstly — carefully unpack your kit, and identify all the components, especially the following:—

Valveholder. This is similar in appearance to the coilholder, but it has a slightly larger centre locating hole. Fit the valve to positively identify. (The valve will not fit in the coilholder.) Tag 2 is not wired.

Coilholder. Care should be taken that the correct tags are wired on the holders. These tags are usually numbered on coilholder, but not always on the valveholder. However, they are the same on both holders, reading clockwise, as shown on the diagram. Tags 2 and 7 are not used on the coilholder. When inserting the coil in the holder, ensure that the spot on the coil goes between tags 1 and 8, which is the position of the slot on the holder.

Variable Capacitors. On all variable capacitors, the terminal marked "M" on the diagram is the moving vane connection. This is the terminal tag that connects to the spindle, and on the tuning capacitor is also the frame. This terminal is always earthed. The Fixed vanes on these capacitors are marked "F". On the tuning capacitor, two separate fixed vane connections are shown, they are of course common, and you can employ both as shown on the diagram, or one only, if more convenient.

Chassis Sockets. Two pairs of sockets are provided, and these should be fixed to the chassis rear panel with the 6 b.a. nuts and bolts provided. One pair of sockets should be used for the headphones, and the other for aerial and earth.

Dials. A sheet of marked dials will be found in the bottom of the box, and this should now have the holes cut for the spindles, and be glued to the outside of the chassis before assembly is commenced. If at a later date, it is desired to fit a larger dial, an extended aluminium panel can be fixed to the front of the chassis.

The next procedure is to mount all the components working with the chassis inverted. Start with the holders for the valve and coil, and these should be mounted from underneath the chassis. Secondly fix the variable capacitors. The tuning capacitor is fixed to the front of the chassis, left hand hole, by the two special 4 b.a. screws provided. These screws are countersunk, and can therefore be identified from other screws. Mount the reaction capacitor in the centre chassis hole. Both the reaction and bandspread capacitors are fixed by a single spindle mounting nut. If you have ordered a bandspread capacitor, you can fix it now, but do not wire in circuit, until the original circuit has been tested.

Finally mount chassis sockets, and thoroughly tighten all screws and nuts.

Wiring. You now commence to wire up the components, as shown in the diagram overleaf. This shows the wiring looking at the chassis from underneath. All connections must be soldered with a hot iron, or you will suffer from dry joints, and the receiver will not work. Leave no bare wires that can short circuit to others or to the chassis, this can fuse the valve.

The wiring is simply, consisting only of eight main leads.

1. The earth lead which joins the moving vanes of the variable capacitors to tags 5, 6, 7 and 8 on the valveholder, tags 6 and 8 on the coilholder, to the H.T. & L.T. negative battery lead.
2. The aerial lead which connects to coilholder tag number 1.
3. The tuning lead, joining the fixed vanes of the tuning capacitor, to coilholder tag 3, and to the fixed capacitor (.0001).
4. The grid lead connecting grid of the valve to the other end of the fixed capacitor and one end of the grid leak resistor (3.3 megohm.). Note that the grid of the valve is the top cap. Use one of the flexible leads for this connection. Solder one end to the grid cap provided and feed this lead through the hole in the chassis in front of the valveholder. The other end of this flexible is anchored to tag number 4 on the valveholder, and then connects to the fixed capacitor and resistor.
5. The reaction lead, connecting fixed vanes of reaction to coilholder tag 4.
6. The L.T. positive lead which connects the other filament of the valve tag number 1, to the other end of the grid leak resistor and also to the 6 ohm dropping resistor thence to the L.T. battery positive lead.
7. The anode lead which joins the anode of the valve, tag number 3 to the coilholder tag 5, and the 10k resistor, thence to headphone socket.
8. The H.T. positive lead connects the headphone socket to H.T. battery positive.

ACCESSORIES

L.T. Battery. A supply 2 volts is required for the valve filament. This voltage can conveniently be supplied from a 3 volt dry battery, and the 6 ohm resistor in the L.T. positive lead will drop the voltage to the correct 2 volts. (When the valve is in

circuit and current.) A very suitable dry battery is the twin cell cycle lamp type 800. The top connection on this battery is the positive. Alternatively for a very long life with much usage, the 3 volts can be obtained by employing two 1½ volt bell cells (flag type) joined in series. Some batteries have terminals and the leads can be screwed to these. However, the type 800 has flat blades for the connections, and we suggest that you solder the battery leads to paper clips and this clip is very suitable for attaching to the battery blades. You should always disconnect the L.T. battery when the receiver is not in use, to prevent wastage, and the resultant run down battery.

H.T. Battery. Any voltage H.T. battery can be employed, from 60 volts to 120 volts depending on the availability from your local shop. The 90 volt type, Ever Ready B126 is very suitable, and the kit includes a battery plug to fit this type. Other makes and types of batteries are of course equally suitable.

Headphones. These should be of high resistance for best reception. (a value of 2000 ohms is normal.) Standard wander plugs should be fitted to the leads to fit the headphone sockets provided in the kit. Most headphones are supplied with loose leads and no plugs, but the imported types usually have thin pins which should be removed, and wander plugs fitted.

Valve. The only type suitable is HL 23DD (Equivalent — AR8 or CV1306). Spares or replacement valves are always available, see price list.

Aerial. Should be as high as possible, and above all neighbouring buildings, it need not be long, 25 to 40 feet. Wholly vertical can be employed as an alternative.

Earth. Is almost as important as an aerial, should be short and direct, and kept moist where buried.

Bandspread Capacitor, where this is included, it should be connected in parallel with the tuning capacitor, i.e., Bandspread fixing and moving vanes connected to the equivalent on the tuning capacitor. Do not connect up the bandspread capacitor until the original circuit wiring has been tested, and found correct. (This capacitor is not supplied in standard kit.)

Coils. If ordering additional coils, always specify "DENCO-H.A.C." type "DX." These are manufactured especially for this H.A.C. design. The adjustable core in the coil should be positioned half way up the coil, i.e., with the screw protruding approximately ½in. out of the top.

OPERATION

Connect up the batteries, aerial, earth and 'phones. Plug in valve. Open reaction vanes, and as they are gradually closed (knob to right) the receiver should go into oscillation, when a faint rushing sound is heard in the 'phones. This "H.A.C." receiver is simple to operate having only two controls, but it must be remembered that tuning is very critical. On amateur bands there may as many as 50 or more stations audible over 2 or 3 degrees. In fact the whole of the 40 metre band is spread over less than 2 metres. Therefore, it will be realised that all Short Wave tuning must be carried out very slowly. When searching for stations set reaction so that receiver is just oscillating, and rotate tuning dial very slowly, otherwise the faint signals will be missed.

NOTE. The reaction must be followed up all the time, so that receiver is just oscillating and no more. Both controls must be manipulated at once. To receive morse signals, the receiver must be just oscillating, but to receive 'phone stations, reaction must be slackened off so that receiver is just below oscillation point.

IMPORTANT: We recommend that you employ coil number 4 for your testing, as most stations work on this waveband.

When the receiver is working correctly, you can then connect up the bandspread capacitor as stated above. You will now use the main tuning capacitor only to set the tuning to the particular band that you require to receive. You should then use the bandspread capacitor for fine tuning over this band, as described above, for station searching.

Constructors who are new to the Short Waves are recommended to read the S.W. articles in the various radio periodicals. "The Short Wave Magazine," "Practical Wireless," and "Short Wave News," give regular articles and hints on S.W. working, invaluable to all interested in this hobby. These magazines also list Short Wave broadcasting stations, give details concerning call-signs and state the best times for listening. From past experience we find that about one out of every 100 constructors meet with difficulty and do not obtain success at their first attempt. If you are unlucky enough to be this odd one please be assured that we will help you and ultimately guarantee that your receiver will operate satisfactorily. If you write to us and give full symptoms, we will endeavour to assist you — please send stamped addressed envelope for speedy reply.

Receivers must not be returned to this office, as we have no facilities for service or testing at this address.