Gilbert Davey's pre-war writing - Download 4:

AT THE SHORT-WAVER'S BENCH - 7

Noises in the Short-Wave Set; Two-valver for the Short-Wave Newcomer

First published in *Practical Wireless* on 15 June 1935.
Published without attribution, but authorship confirmed on Davey's own list.

Safety: It is your own responsibility to ensure that you work safely and that equipment (especially mains-operated power supplies) is soundly built and adequately housed. If you are in any doubt about your understanding of the information given or referred to in this download, or about your ability to work safely, you should seek the help of a qualified person.

This is the first of three articles selected from Davey's 13-part series "At the Short-Waver's Bench", published in *Practical Wireless* almost every week from 20 April to 27 July 1935.

Noises in the Short-Wave Set

The first section of the article is self-explanatory. Several of Davey's pre-war articles dealt with noise problems. A really silent set was a great help in station-getting, and for this reason Davey later expressed his regret at the demise of the dead-silent 2-volt valve types.

Two-valver for the Short-Wave Newcomer

For the broadcast bands, there was an ample choice of commercially-made receivers. Some of these offered short-wave reception, There was much less choice in ready-made sets for short-wave enthusiasts, and many - perhaps the majority - built their own.

This short-wave two-valver, with leaky-grid-with-reaction first stage, is entirely conventional for its time. Depending on operating conditions, a simple set like this could offer astounding performance and range on telephony (AM). Many enthusiasts of today are delighted to discover, or rediscover, the fun that a simple regenerative receiver can provide. It could also have been used to receive Morse transmissions (CW) if adjusted to oscillate gently, but strictly this was (and still is) illegal as the set acts as a transmitter in this state. SSB, although already used commercially at this time, was still in the future for amateurs.

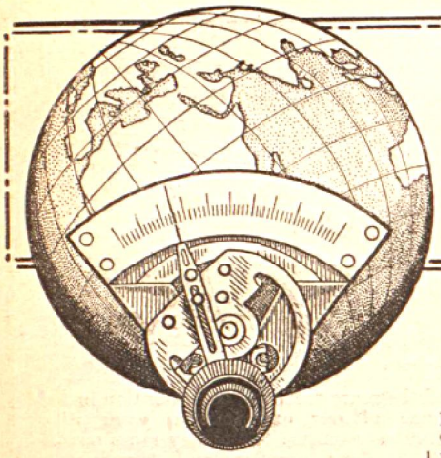
Construction
The layout drawing only shows the detector stage, and few constructional hints are given. One suspects that this article was edited to fit on a single page. Each of the two variable capacitors (tuning and reaction) is shown with a central connection to the moving vanes, and two outer connections to the fixed vanes. The signal to the interstage transformer is led from the right-hand end of the HF choke.

Power supplies
This set is intended for battery operation. Suitable voltage tapping on the HT battery would be connected to each stage. An accumulator powers the filaments. A grid-bias battery is required for the output stage.

Coils
Davey recommends a coil designed for 22 - 47 metres (13.6 - 6.4Mhz) as being the most interesting part of the spectrum for beginners. Some manufacturers of plug-in coils designed them to fit into valveholders such as the B4 holder as shown in this article. Others did not, and in an earlier article (9 February 1935), Davey had argued in favour of standardisation for plug-in coils.

Detector stage
The reaction control is wired as a "throttle" from the HT side of the reaction winding to ground, in contrast to the more common arrangement of connecting it in series with the winding.

Output stage
Coupling to the simple output stage is via an interstage transformer whose secondary is in series with the grid-bias battery. As with many circuit diagrams of this period, the loudspeaker, if low-impedance, is assumed to be driven via a suitable output transformer.



SHORT WAVE SECTION

At the Short-waver's Bench—7

Amongst the Subjects Dealt With in This Article is a Simple Two-valve S.-W. Receiver

Noises in the Short-wave Set

MANY and varied are the puzzling noises which crop up occasionally in a short-wave receiver. They are frequently extremely difficult to trace, and therefore a small amount of space is devoted to them. The noises which will be given but passing mention are the commonplace troubles due to faulty grid leaks, resistances, broken transformer windings, and leaky condensers. These should always be suspected first, and, having been found not to be at fault, attention can be turned to the tuning and reaction condensers. Considerable trouble was recently experienced with a solid-dielectric reaction condenser of which the dielectric had worn through in one place, allowing the moving and fixed plates to scrape at that particular spot. Any scraping of plates in a tuning condenser on short waves will mean very noisy crackles, and so will the rubbing together of the "pigtail" as the vanes are rotated. If a condenser of brass is in use which has steel ball-bearings, it may be found that a noise occurs due to the chemical reaction set up by the rubbing together of two dissimilar metals. This only makes itself heard on short waves, and can be cured by the use of a special S.W. condenser with phosphor-bronze bearings.

In another case, trouble was experienced with an all-mains short-waver which gave out crackles as the tuning condenser was rotated. After a long and arduous search, the trouble was found in the mains-unit in use. This unit was adjustable on the mains side for different voltages by means of sockets, into the correct one of which a plug was placed. Apparently movement of the tuning condenser transmitted *via* the table an infinitesimal movement to this plug. Nothing amiss arose with the unit on broadcast bands, but on short waves noises occurred. Mention of all-mains short-wavers calls to mind the fact that hum can be most unbearable and difficult to trace in such a receiver in which the valves make poor contact with the valve-holder sockets. Many noises, too, can arise from this cause, particularly if a valve is able to make the slightest movement. A valve which is losing its emission will generally increase the over-all noise level, and often give rise to noises similar to atmospherics. These latter, by the way, are now beginning to become troublesome, so that the set must not be accused unjustly of causing them. It is believed that the few hints given will, however, help those who are troubled with a noisy receiver.

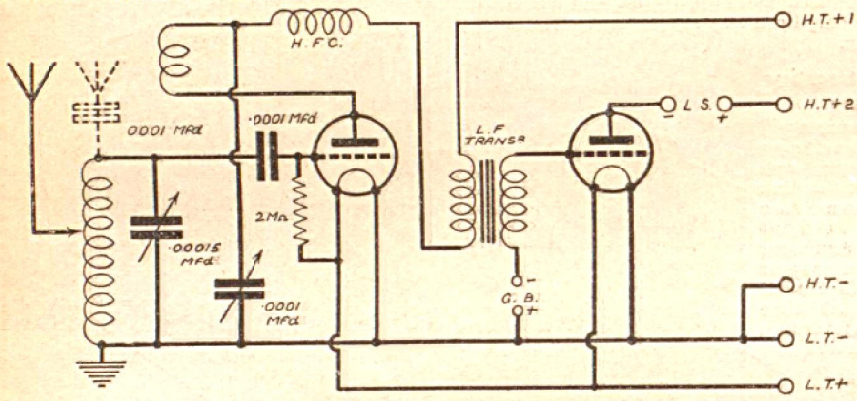


Fig. 1.—A good simple circuit for the beginner to use for short-wave reception.

The Newcomer to Short Waves

Probably there are many who read these notes and the rest of the short-wave section week by week who have never owned a short-wave receiver, but are just "interested" in the subject. They may not realise how much they are missing, and how cheap and easy short-wave work is. I suggest they build a receiver to begin with on the lines of the circuit given in Fig. 1, which shows a cheap and simple two-valver.

Such a set can be built for a few shillings, and if you use the valves and loud-speaker from the "family" broadcast receiver it will be even cheaper. The loud-speaker can be used to begin with, even for America, and, in fact, there will never be any necessity to buy 'phones, unless you become an extraordinarily keen "fan." The aerial is attached to a crocodile clip and is clipped on to any part of the coil that gives best results, or, alternatively, the permanent connection, as shown in dotted lines on the diagram, may be made. The coil used may be of the four-pin variety to plug into a valve-holder, and I recommend that, as a commencement, just one to cover the interesting band from 22 metres to 47 metres be obtained. Suitable coils are made by Colvern, B.T.S., and Eddystone. Reaction is "throttle-controlled," a system which is generally considered the best on short waves. The tuning condenser should be the best it is possible to afford. An air-dielectric reaction variable of the better type may be tried in this position, but a proper short-wave condenser should be fitted for the best results. Little more need be said concerning the circuit, but, with regard to the lay-out, shortness of all wires carrying H.F. is a vital point, and this means that the wiring to the detector valve-holder must be kept from wandering all round the components. Connections from the coil-holder must be made direct. The suggested lay-out for the detector stage is shown in Fig. 2.

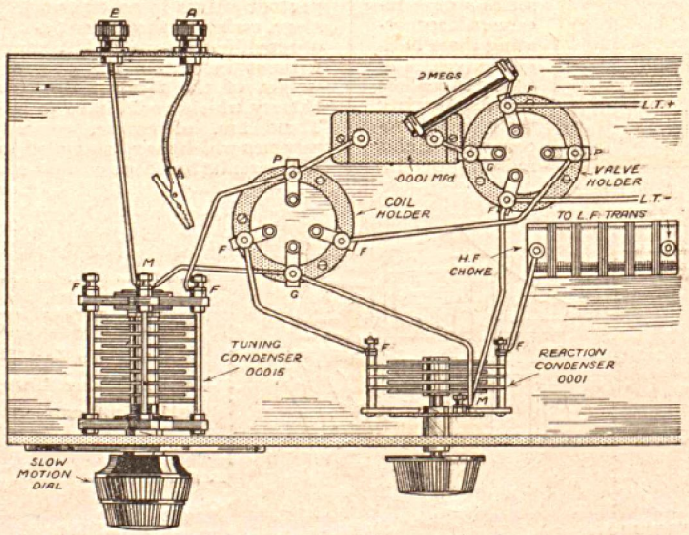


Fig. 2.—A suggested layout for a receiver using the circuit given in Fig. 1.