



AC (alternating current) and the periodicity (number of cycles per second). The simplest way of doing this is to examine the electric meter. The markings on the meter are usually standard, and 240 V AC would be marked = 240V 50. The sign or indicates that the system is AC and the figure 50 indicates the number of cycles per second. Direct current (DC) is usually marked as follows = 240V — or 240V. Unless the set has been specially made for the purpose, DC should on no account be connected to the set. The consequence of connecting DC to AC set would be a burnt-out mains transformer. Further, the number of cycles per second is important as, although most supplies are 40 to 60 cycles and therefore quite suitable for a 50 cycle transformer, there are instances of 25 cycle mains still in existence in certain towns. This slow frequency change imposes a big strain on a standard transformer and would soon cause a breakdown. If a case of 25 cycle mains is notified, a specially heavy winding is fitted to the transformer to compensate for the strain. Always adjust the mains to the next higher voltage if the exact figure is not indicated.

We now proceed to the actual operation. It is recommended that the received should be adjusted first as this shortens the actual time of transmitting. This means that if the transmitter is adjusted first a signal goes on the air immediately the key is pressed. Failure to adjust the received first will cost you three or four minutes in trying to get the home station, which time could have been saved. It is important that you should read the graph as accurately as possible because much time can be lost in searching for a signal. In the case of sets with a bandspread or fine tuning control, the main tune condenser should be set accurately according to the graph and final searching conducted by means of the fine tuning control. The latter should be set at the middle of the scale

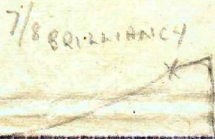
with the pointer of the centre point. A little practice with these controls will illustrate this point. The correct control setting is very critical, in so far as the sensitivity of the receiver depends on it. The best way to go about the adjustment is to turn the knob fully anti-clockwise, when signals are heard. This is the most sensitive point and any further turning in a clockwise direction will result in the receiver becoming less sensitive as well as less selective. Another unfortunate consequence of turning too far is that a point is reached where a secondary "pop" occurs, usually accompanied by a slight continuous whistle in the headphones termed "squiggle". In this condition the receiver radiates an audible signal on the aerial, thereby increasing the chances of detection.

For the sake of clarity we repeat the various adjustments again in order. First, adjust the condenser exactly to the graph setting of the frequency of signal you are going to receive, making sure that the correct receiving coil is in place. Second, adjust the reaction exactly, as indicated above. You are now ready to receive and the tuning control should only require a very slight adjustment. As long as you stay fairly close to the same frequency, the reaction should not require further adjustment. It should, however, be remembered that if you change to another frequency the whole routine has to be repeated. Next, switch over to "Transmit", insert crystal and switch to correct frequency range. Generally speaking, the coil ranges can be taken as follows:-

3000 kilocycles to 5000 Kc. = 80 meter band  
5000 " " " 9500 " = 40 " "

Then press the transmitting key and adjust 1) the TANK condenser to maximum light in bulb, 2) the AERIAL condenser to maximum light in aerial bulb, 3) reduce light in tank bulb slightly. You are now ready to transmit. In connection with item 3) it is important that the light should be reduced slightly in the proper way. If you turn

the tank control very slowly in one direction from zero light to maximum and then right on past maximum, it will be noticed that on one side the light comes up very gradually, and after the maximum is passed the light goes out suddenly. The reduction should be made on the gradual side always. We give a graphical explanation as follows:-



zero light

The reason for this adjustment is that if the wrong setting is taken, the crystal will have a tendency to stop oscillating when the key is pressed, with, of course a consequent unintelligibility of signals.

There is also a right and wrong way of putting in a crystal. This refers to the type with a metal top. The quartz is held between two plates, one of which is on top. As the crystal is usually connected between the control grid of the valve and the earth, it will be seen that the top plate should be the one which is earthed. A simple test will tell you when it is right or wrong. Touch the top of the crystal with the finger (do not tap or knock it) and if it is correct the light of the tank bulb will not vary. If it is wrong, the light in the tank bulb will go dim or fade out altogether. If that should happen, reverse the crystal in its socket.

**Faults:-**

A proper system should be followed if a fault is to be traced quickly and with certainty. Haphazard searching may result in a quick repair, but it will also entail hours of lost time. On the other hand, if a system is adopted it should be possible to trace a fault in a few minutes. The following procedure is strongly recommended and should be carefully studied.

If neither the transmitter nor receiver will work when the mains are switched on, it is as well to make sure the plug is "live". This can be ascertained by testing with a lamp. A test lamp is very easy to make and invaluable. If the mains plug is alright, then carefully examine the connections to the plug. A very common difficult fault sometimes occurs where the wires bend on entering the plug. It is often found that the wire has fractured, leaving the flex apparently alright but held together only by the rubber insulation. The best way to check for this is to give each wire a good pull. This will at once show whether the wire is broken or not. If the mains and the plug are O.K. check all external connections and components such as coils, headphones, crystal etc. before proceeding to take out the chassis. These parts can be tested by substituting your spares, or, in the case of the transmitter, try another frequency band. After you have satisfied yourself that everything outside the set is alright, you can remove the chassis, being careful to remove the right screws (usually those underneath). Use your test lamp across the point where the mains lead connects to the transformer. This test will prove whether the mains lead from the plug to the set is alright.

Always test the operation after each repair or adjustment has been carried out, as it will be most unlikely that more than one fault will occur at a time.

It is well to remember that although a valve is heating, this is no guarantee that it is operating correctly.