

time has come when every successful receiver must be taken to operate from the electric light mains, and although this can be very easily done on medium and long wave receivers it is by no means so easy to operate a short wave outfit from such power supplies. All the little noises, crackles and interference which are introduced into the receiver by the electric light mains (and which pass almost unnoticed by ordinary broadcasting set reception) are magnified enormously in a short wave receiver.

When short wave reception is confined only to aural broadcasting and where, as at the moment, it has little entertainment value, this electric light mains trouble is not serious. When, however, we have to rely on short and ultra-short waves for our main broadcasting entertainment and when in addition television is introduced, then this interference will be serious. A slight hiss or rustle in the background of an ordinary broadcast trouble is seldom noticed even with the high quality receivers of to-day, but in a television outfit any such interference is immediately obvious on the television screen and is made manifest in the form of speckled dots and wavy lines over the image.

Detailed improvements in components are bound to be made for we are a long way from finality in the design of tuning systems, coils, detection systems and even in power amplification. We must not decry the efforts of the power amplification engineers who have done such good work during the past five years in developing large amplifiers for radio and sound film systems. The talkie film engineers indeed are to be congratulated on several improvements they have made, and for the introduction of new forms of low frequency couplings, and of loudspeaker systems. Many of these developments can be applied to domestic receivers, but, of course, the ordinary type of loudspeaker as we know it to-day is far from perfect. I can predict with confidence that before scientists are really satisfied with sound reproduction over a sufficiently wide frequency range, an entirely new form of loudspeaker will be introduced in which some means of transforming electric vibrations into sound waves will be incorporated.

At present this transformation is made by means of a vibrating diaphragm, the moving part of the diaphragm being operated either by a magnetic or an electro-static system. Electrostatic loudspeakers are becoming more and more prominent. This after all is only a reversal of the idea of the condenser microphone as used by broadcasting engineers at the transmitting end. I feel, however, that all these systems have mechanical limitations which must be overcome before we can truly be satisfied with the last link in the chain of an aural broadcasting system.

When details like these have been attended to, and we are quite satisfied that our radio link is satisfactory, then other television problems will not seem so difficult.

We may now be only a few months away from really successful film television. It is highly probable that the transmission of films will take precedence over the television of actual moving scenes during the early stages of commercial television. We must acknowledge the fine work of Baird and his associates, and we can reflect with pride on the fact that great pioneering work

in television has been done in this country. We shall be extremely foolish at this stage to let other countries get ahead with systems of film television when we ourselves know so much about film scanning and cathode ray systems.

Already the B.B.C. is satisfied that the film transmission of television is a good proposition for home entertainment.

There are factories in this country turning out the specially designed cathode ray tubes used at both the receiving and transmitting ends of such systems, and I feel sure that during the next twelve months some remarkable developments will be made in the cathode ray

tube which is, after all, the vital link of a television system. The cathode ray tube is a sort of second cousin to the radio valve, and when we realise what amazing developments have been made in the valves since Professor Flemming first conceived the idea, we can appreciate the fact that there is plenty of room for development in cathode ray tubes.

By PROFESSOR A. M. LOW In The "Listener In" (Melbourne)

Professor Low is a very famous scientist, author of "Wireless Possibilities," "Tendencies of Modern Science," "The Wonder Book of Inventions," etc.

American and German television experimenters are making great progress, but there is no reason why British engineers should lag behind. I feel that in only a year we shall have no cause to feel ashamed of our own progress in television transmission and reception. At the moment the great problem is to get plenty of detail in pictures and to transmit this detail on a radio link without taking up too much space in the ether. I think that even the least technical will realise that the more detail you want to transmit in a picture the more space you must take up in the broadcasting ether. This is space we can very ill afford, in view of the wave band limit, and the present chaotic conditions.

For this reason, unless some radically new method of television transmission is devised, it is almost certain that this now form of entertainment will be broadcast on the short or even the ultra-short waves, where there is infinitely more room to spare. For example, only 96 stations can be comfortably accommodated on the present-day broadcast band extending from 200 to 550 metres; whereas on the ultra-short waves, between 2 and 5 metres, no less than 900 stations could transmit without interference.

It may transpire, as I prophesied many years ago, that eventually transmission on the electric light mains, or even the water pipes of the country, may supplement ordinary radio broadcasting as a means of home entertainment. When the whole country is connected by vast electrical grid wiring systems, it will be a comparatively simple matter to transmit programmes by electric light mains. Very probably there will be exchanges, so that the subscribers can switch on to various programmes. For the benefit of technical enthusiasts, it must be emphasised that the transmission over the electric light wires will be made with a high frequency system similar to radio broadcastings, and not with the low frequency sound system that was used in the very early days. I feel that if during the next year we make some real progress in transmitting programmes at radio frequency over the grid system, we shall have gone a long way to ensuring interference-free broadcasting entertainment for forthcoming generations.