The mechanics of propagation Part I

A practical understanding of propagation is fundamental to the practice of amateur radio. In this article we look at the HF spectrum. Next month VHF.

The manner in which radio waves manage to travel long distances in getting from point A to point B is arguably the most fascinating aspect of amateur radio and, like it or not, there comes a time when the text books get dragged out to find out just a bit more about the subject than is required to pass the Radio Amateur's Examination. It is the vagaries of radio propagation, as it is called, where one's favourite HF band is full of exotic DX one day and virtually dead the next, that never fails to intrigue whether one is a young beginner or an OAP.

One way of finding out what propagation is all about, if you are a listener, is to log everything you hear on every HF band for a couple of years, or preferably 11 years (more on this later) after which it will begin to percolate through the grey matter that seperates the headphones that there seems to be some sort of a plan in it all after all! That certain parts of the world come through best on a particular band at a certain period of the day, or night, and that these factors change slowly with the season of the year.

If you keep at it for 11 years or so it will be found that there is yet another cycle in propagation conditions that peaks very roughly every 11 years. This corresponds to the level of sunspot activity which has a very profound effect on propagation. Other interesting phenomena include a complete wipeout of virtually all HF frequencies for varying periods and brief periods of intense noise that also tends to over-power all the usual signals. If anyone knows of a hobby more exciting than amateur radio I'd like to know about it!

Of course, if you are a licensed amateur already you can carry out all this research yourself by working everything you hear instead of just logging it. All very tedious, naturally, when a relatively short study of just what goes on 'up there' will reveal it all. This knowledge will be absolutely invaluable when taking part in a DX contest or in a Field Day when advance plans can be laid down so that operation can take place on the most advantageous bands at any time of the day or night. This can make all the difference between coming in the top ten and dithering around at the bottom of the listings. However the techniques of contest operation deserve seperate treatment.

As far as the HF amateur bands are concerned they cover 1.81 to 29.7 MHz (generally referred to as