Using 10 Metres

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A casual tune around during the day (and it is primarily a daytime band) may tend to give the beginner the impression that there is little activity, or that the Europeans have a hold on the band to the exclusion of other areas. For those that know it, and how to use it, the band can be very exciting, especially in its sometimes unpredictable behaviour.

During the past few years, the band has been at its best, with DX stations there for the taking using low power and simple aerials, often open for much of the day to virtually all of the world at once. However, we are now well on the downward path and it will not be long before the DX has to be worked a lot harder for, although this can still be done with low powers and simple antennas. As well as DX, Ten is an ideal band for local QSOs and much of the traffic passed on 2 metres by the Class A licencees could usefully be rerouted to 10 metres to relieve the VHF band of some of its congestion on the FM channels.

The 10 metre band appears to be viewed in a strange light by many amateurs. There are those who rate it as the best of the HF bands, and those who seem to think of it as a rather strange band that is only of use during sunspot maxima periods such as we have just been through.

Ionospheric propagation

There are a number of ways in which signals reach other parts of the world. Most of these depend on the reflection of the signal by the Ionosphere, or more correctly, one of the Ionospheric layers, of which there are several.

The majority of real DX signals are propagated by the F2 layer which is the highest, with the height depending on the season, time of day, latitude and the state of the sunspot cycle. The other layers (D and E) are of no interest to us at 28MHz as they do not reflect at this frequency. Usually around 120-260 miles above the Earth's surface, the F2 layer is present during both day and night during the peak of the sunspot cycle, but once the sun has set the reflective properties rarely extend as far as 28MHz. Hence the band is only 'open' during the hours of daylight, plus maybe an hour of two into darkness during the peak of the sunspot cycle.

The maximum ionisation level occurs at around mid-day for the mid-point of a given path during the Winter, and a bit later in the Summer. The earliest time at which a QSO can start over any given East-West path thus depends on the position of the Earth relative to the Sun, and the state of the Sun itself.

MUF

Whether or not 10 meters will support DX propagation via the F2 layer depends on this highest frequency or MUF (Maximum Usable Frequency) at any given time — if the MUF is below 28MHz then signals are not reflected and little propagation will take place. At sunspot minima times, there is usually a two to three year period, mainly affecting East-West paths, when the MUF very rarely gets to 28MHz, although contacts with Africa are still possible around midday on a few days of the month.

As one might expect, during sunspot maxima periods the incidence of the MUF being above 28MHz is high — it can get as high as 70MHz, and it is during these times that the 6 metre band supports propagation over the Atlantic, allowing cross band QSOs via 10 metres with the States (and possibly direct on 6 metres if we get full access to the band).

The distance your signal will travel via F2 propagation depends on the angle at which the signal hits the layer (dependent on the angle of radiation of your antenna), and on the number of hops it makes between the layer, the earth, and back again. A single hop signal can cover up to a maximum of about 2500 miles, with a minimum of about 1200 miles (the distance will vary with ionospheric conditions, and the angle at which the signal is reflected, and the critical angle for the frequency). For communications at distances below this skip distance, other modes of propagation take over.

One interesting effect occurs when the MUF is only just above 28MHz. Under these conditions the F2 layer acts as an almost perfect RF