Understanding Propagation

In February, try using the 30m band as it can be a great band for DXing.

30M: BAND OF THE MONTH – FEBRUARY 2009. So far in this series we have looked at 160m, 80m, 40m and 20m. The keenest of you will have realised that we have missed a band. But I aim to put that right this month by focusing on 30m (10MHz).

Thirty metres was given to radio amateurs in 1979 as part of the WARC (World Administrative Radio Conference). It is often forgotten about, but is actually a great band for DXing, as long as you like digital modes and CW (there is no SSB segment on the band plans).

THEORY. I have often read that 10MHz shares the characteristics of both 40m and 20m, but at first sight this sounds ridiculous. Twenty metres (14MHz) is predominantly a daylight band, closing after dark in the winter as the MUF (Maximum Useable Frequency) drops. Forty metres (7MHz) on the other hand is not much of a DX band during the day, but comes alive after dark. The purists will realise that this isn't strictly true as 40m can be open 24 hours a day in mid winter and 20m can be open late into the evening in the summer, but bear with me.

So how can 30m have the characteristics of both bands? To answer that question we need to go back to first principles.

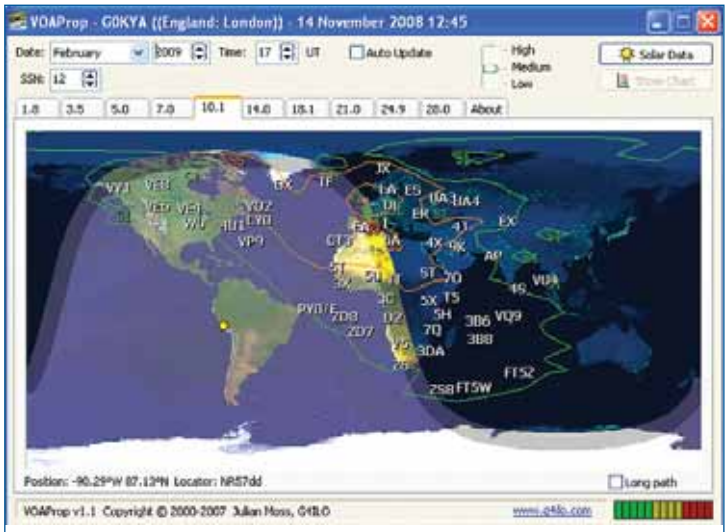
Propagation on any DX path is fundamentally subject to two factors – the Maximum Useable Frequency (MUF) and the Lowest Useable Frequency (LUF). The MUF is determined by the sunspot number, the time of year and the time of day, and generally is higher during periods of heightened solar activity. The MUF is the highest frequency that the F layer(s) can refract over a given path, if working DX. Go higher than this and your signals escape into space.

At the same time we have the lowest useable frequency, which is the lowest that can be propagated along the same path without being totally attenuated by the D layer. Go lower than the LUF and your signals are absorbed before they get to their destination.

So put the two together and we are left with a small range of frequencies, a channel if you like, that we need to work in to make our contact.

Now we begin to see how 10MHz fits in with the adjoining bands. At times 20m and 30m will both be open to the same parts of the world. At others, the MUF will have dropped so that 20m is closed and 30m and 40m able to propagate signals.

Conversely, there will be times when 20m is closed, but the MUF is high enough for both 40m and 30m to be open at once. But during daylight hours the LUF might be higher than 40m, so closing the band to DX, but leaving it open on 30m.



Propagation on 30m at 1700hrs in February according to VOAProp. The band is open to a large part of the World.

We must think of the band in terms of the current lowest and maximum useable frequencies in order to make any sense of it. This is where a propagation prediction program like the paid-for Ace-HF, or W6ELProp and VOAProp (both free) come into their own.

IN PRACTICE. So what can you expect to hear on 30m? Well at midnight in February we find that 30m is likely to open to the south, taking in Northern, Central and Southern Africa. As the night moves on the propagation will shift to the south-west, heading towards the Falklands and South America by about 0000-0400hrs. Propagation then shifts towards the east as the MUF on that path rises as the sun comes up over Africa and Russia.

By 10am, D layer absorption in the southern hemisphere (where it is summer) is so high that the path is closed. But now we have propagation to North America and the northern climes of Asia.

This continues through the morning and early afternoon, and by 4pm the band is now open to Western Australia, Asia and north-west Canada. As the afternoon progress to evening we can now work the whole of Africa again.

This is what makes 30m such a fascinating band – it is open to somewhere virtually 24 hours a day, whereas 20m is often closed during the night and 40m won't get far during the day thanks to D layer absorption.

The other good news is that, on the whole, you won't be fighting stations with massive Yagis and a half-wave dipole is actually quite short, at only 15m in length.

I have worked many DX stations on 30m, often with very few pileups. In fact, it is my first band of choice whenever a new DXpedition starts up. I have managed to snag Mauritania (5T5DC), Syria (YK9G), San Marino (T77C), Libya (5A7A), St Branson (3B7C) and Oman (A45XR) on 30m, all on CW and often with about 25W.

This may seem like small fry to many DXers, but they were all caught using either an inverted V half wave dipole on a fishing pole, an MFJ 1786 magnetic loop in the attic or an 85ft end-fed wire (W3EDP), which was catapulted over the roof of the house and is almost invisible.

No wonder 30m is such a well-kept secret! If you are not a fan of dits and dahs, turn to 10.140MHz and join in the fun with PSK31. There is lots of activity.

In fact, you can try working some 30m DX yourself in February, thanks to the Desecheo Island DXpedition running from 12 to 26 February.

Desecheo is a small, mountainous island in the Mona Channel, approximately 14 miles west of Punta Higüero, Puerto Rico.

From the UK, the 30m band should open to KP5 from around 0930 – 1230hrs, and then again from 1730-2200hrs, with another opening in the early hours of the morning.