
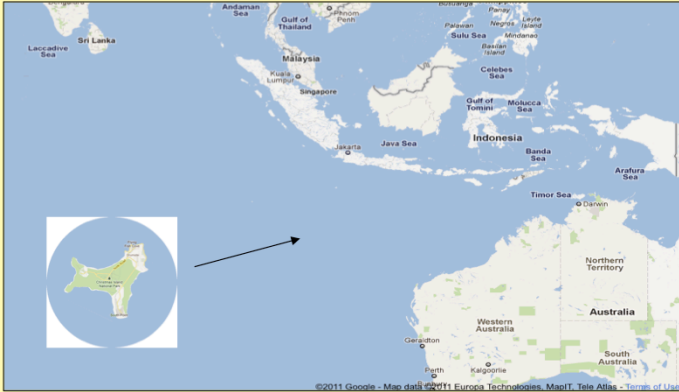





This was the presentation shown at the RSGB Convention on Sunday 9 October 2011. It includes the predictions versus the actual contacts made with T32C Kiritimatii as at Friday 7<sup>th</sup> October.



## Firstly – where is it?

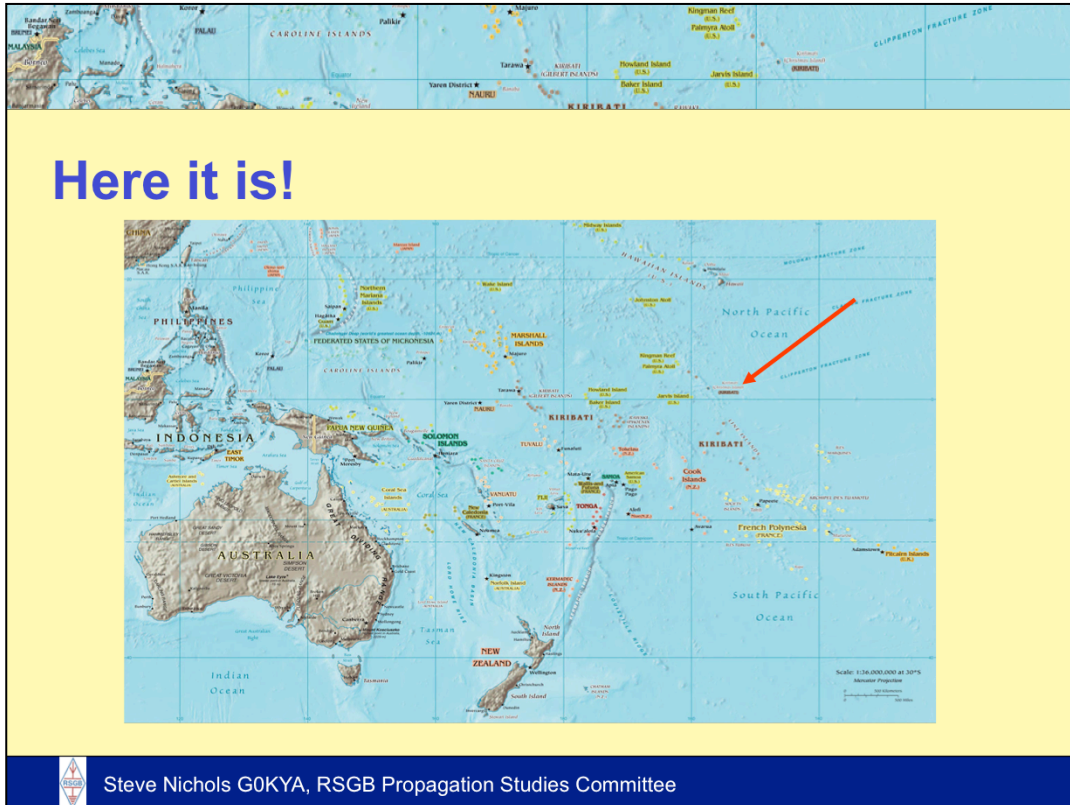


## Well, it isn't here!

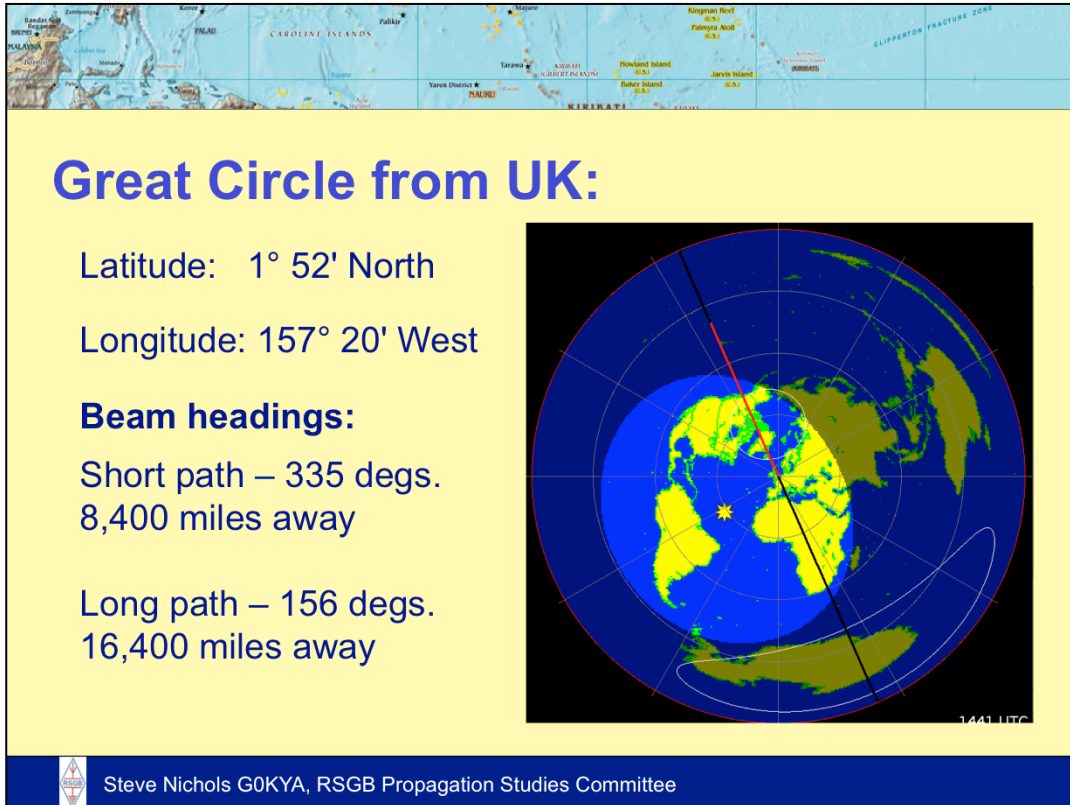


Steve Nichols G0KYA, RSGB Propagation Studies Committee

The first question is “where is it?”. Kiritimati, or Christmas Island, is a Pacific Ocean atoll in the northern Line Islands - it should not be confused with an island of the same name in the Indian Ocean (VK9/X)!

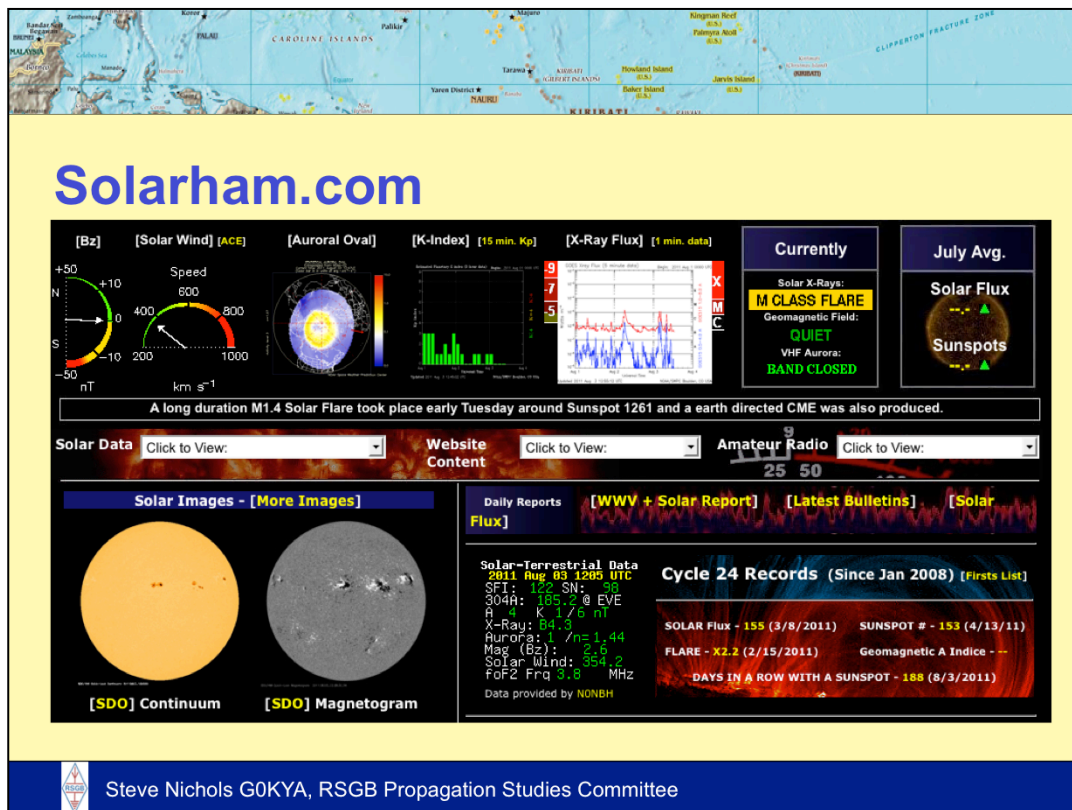


The island lies 144 miles north of the the Equator and 8,400 miles from the UK, south of Hawaii.



This highlights the first propagation problem – Kiribati lies on a beam heading of about 335 degrees from the UK which puts our signals slap bang through the auroral oval around the north pole. Conversely, the long path heading of 156 degrees (and 16,400 miles) goes through the south auroral oval.






[www.solarham.com](http://www.solarham.com) - This tells us that we need to keep a close eye on the A and K indices during the DXpedition. An unsettled geomagnetic field is a sign that solar ions are being funnelled in to the poles. While the resultant aurora can be very pretty it won't do much for ionospheric propagation over the poles so we really want to see very low A and K indices.

The K index is updated every three hours whereas the A index is an average of the previous 24 hours. So look for a K index of 1 or so for the best results or an A index less than 10 - see [www.solarham.com](http://www.solarham.com). Another indicator is the solar wind indicator. This shows the current state of the interplanetary magnetic field (IMF) and we really want to see a low solar wind speed (below 400km/s) and a Bz (magnetic field direction) pointing north or at least neutral and not south.

A southerly Bz will result in ions being coupled into the earth's magnetic field more readily, which we don't want.

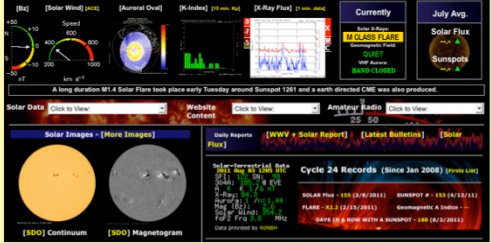
In any event don't be surprised if the signals from T32C sound a little fluttery – this is quite common for signals coming over the poles.



## Solar Indices

If using a VOACAP-based propagation program, like **ACE-HF** or **WINCAP Wizard** use smoothed sunspot numbers.


October – 49.9 (SFI 102)



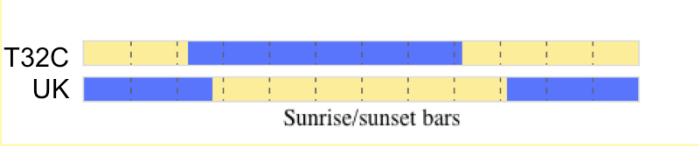
Steve Nichols G0KYA, RSGB Propagation Studies Committee

While it is impossible to predict with any accuracy what the solar flux will be (I'm was writing this in July) we can make an assumption. First off, the VOACap-based propagation prediction programs work best with a smoothed (or averaged) sunspot number.

The smoothed sunspot figures at the National Geophysical Data Center for October are 49.9. These equate to a solar flux index of about 100-102. This is at least a starting point and we can move on.



## 160m – mutual darkness




Sunrise/sunset bars

At the beginning of the DXpedition the sun sets at T32C at 04:22UTC. The sun rises in the UK at about 05:56UTC.

At the end of the DXpedition this window moves to 04:15UTC – 06:45UTC.

A very tough path

 Steve Nichols G0KYA, RSGB Propagation Studies Committee

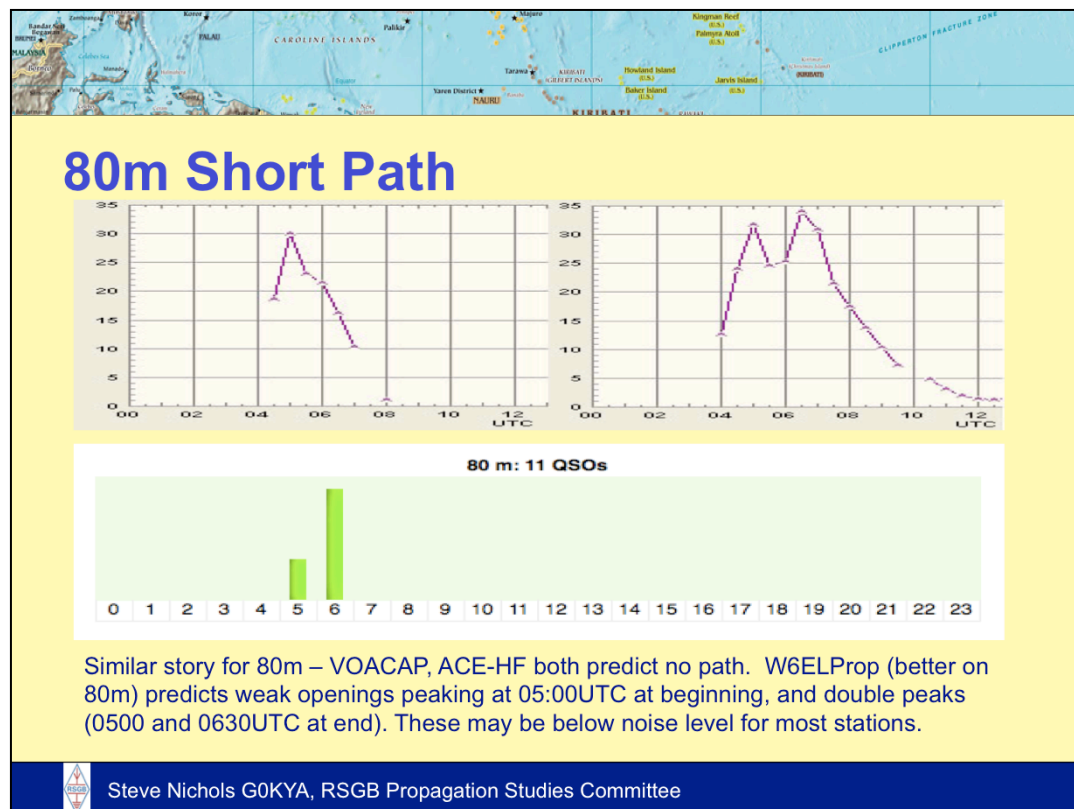
If you are to work T32C on 160m you are going to need a decent Top Band antenna and an electrically quiet location. You also need a dark path between you and T32C which limits your operating time dramatically.

At the beginning of the DXpedition the sun sets at T32C at 0422UTC. The sun rises in the UK at about 05:56, so you have a small window of opportunity between those times. At the end of the DXpedition this windows moves to 0415 – 0645. These are for the short path.

There are possible greyline opportunities, possibly around the sunset/sunrise, but they are hard to predict.

If you want to work them on Top Band you are going to have to get up early – and signals are likely to be very weak to non-existent!

At the end of the first week only 2 GM (Scottish) stations and one Northern Ireland (GI) station had made it on top band. No G stations were through.

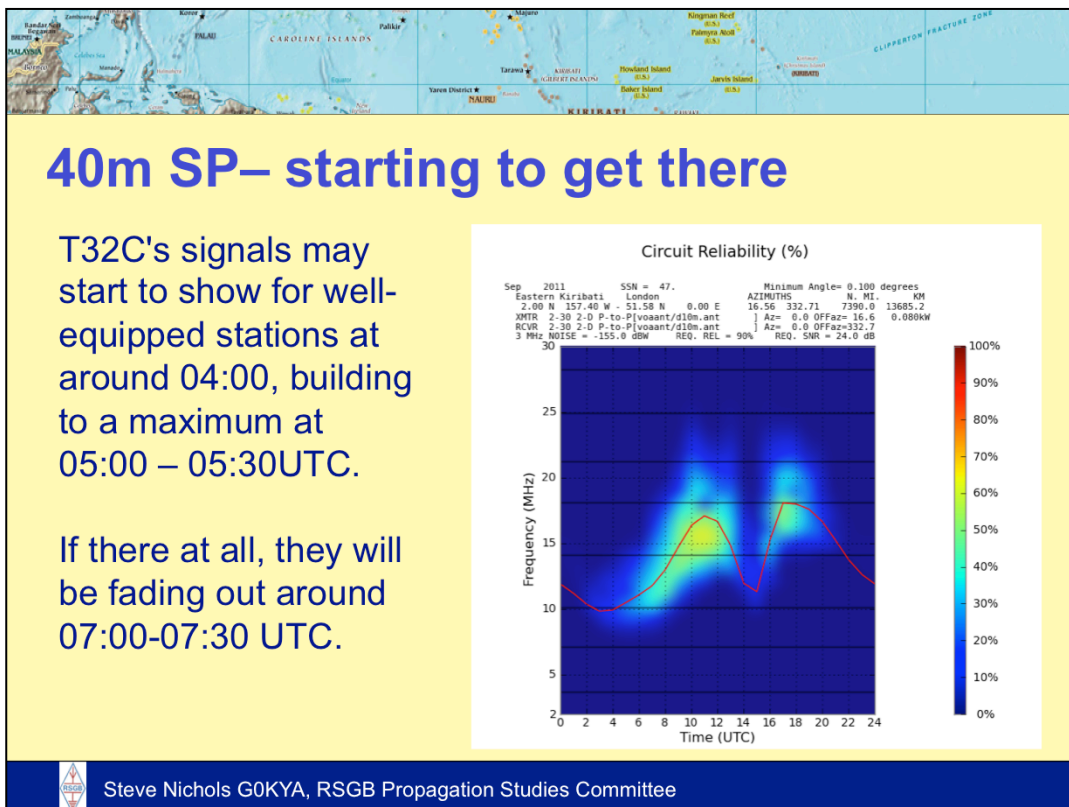


The top plots show 80m propagation predictions from W6ELProp for September and October – note how conditions improve as the Dxpedition goes on. The lower plot are the actual QSOs so far.

While you don't necessarily need to have a completely dark path between you and T32C the times will be similar to Top Band – in the 0430 – 06:30UTC timescale at the beginning of the DXpedition, moving out to 0400 – 0900UTC towards the end.

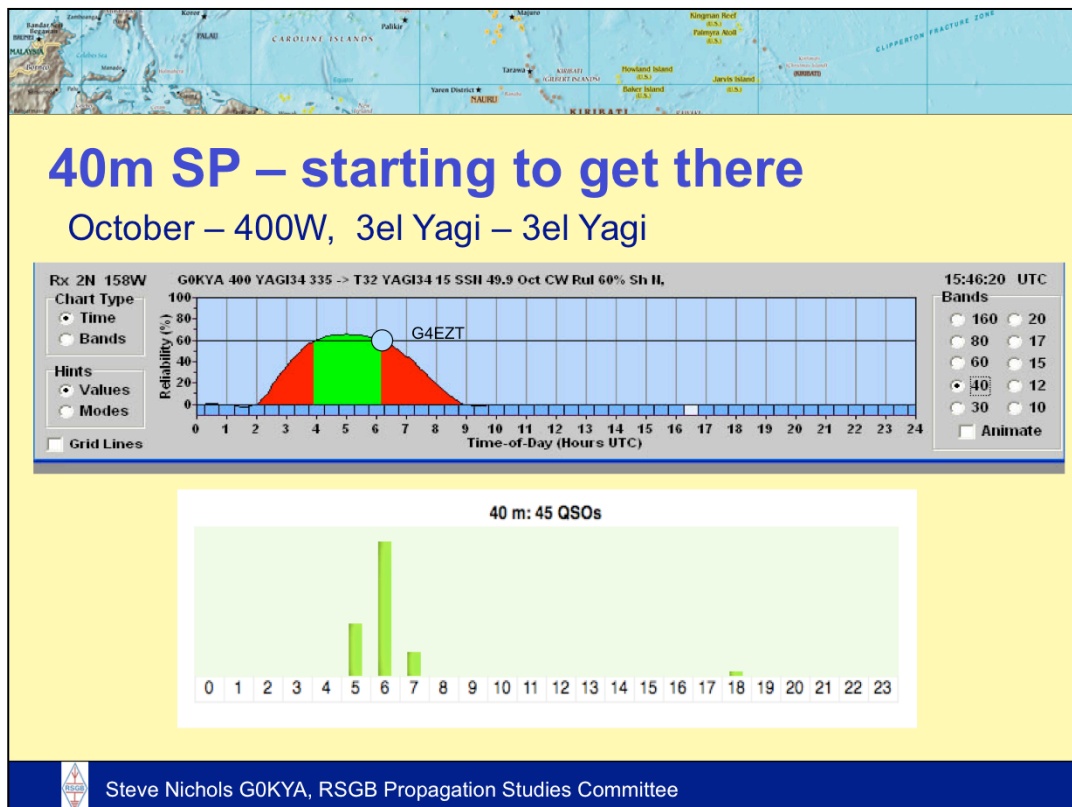
Prediction software suggests that best times will be the middle of this period (around 0530 – 0630UTC) but there might be sunrise/sunset enhancements. Again, this is not going to be easy and weak signals are likely to be the order of the day.

VOACAP is notoriously pessimistic about 80m opening as it was not designed to operate that low in frequency. W6ELProp is better and predicts weak openings peaking at around 0600UTC on 15/10.



Forty metres is a little more forgiving in terms of a dark path, which means we have a slightly longer sweet spot. Nevertheless, you need to be on the band early in the morning. At the beginning of the DXpedition signals may start to show for well-equipped stations at around 0400, building to a maximum at 0500 – 0530UTC.

If there at all, they will be fading out around 0700-0730 UTC.

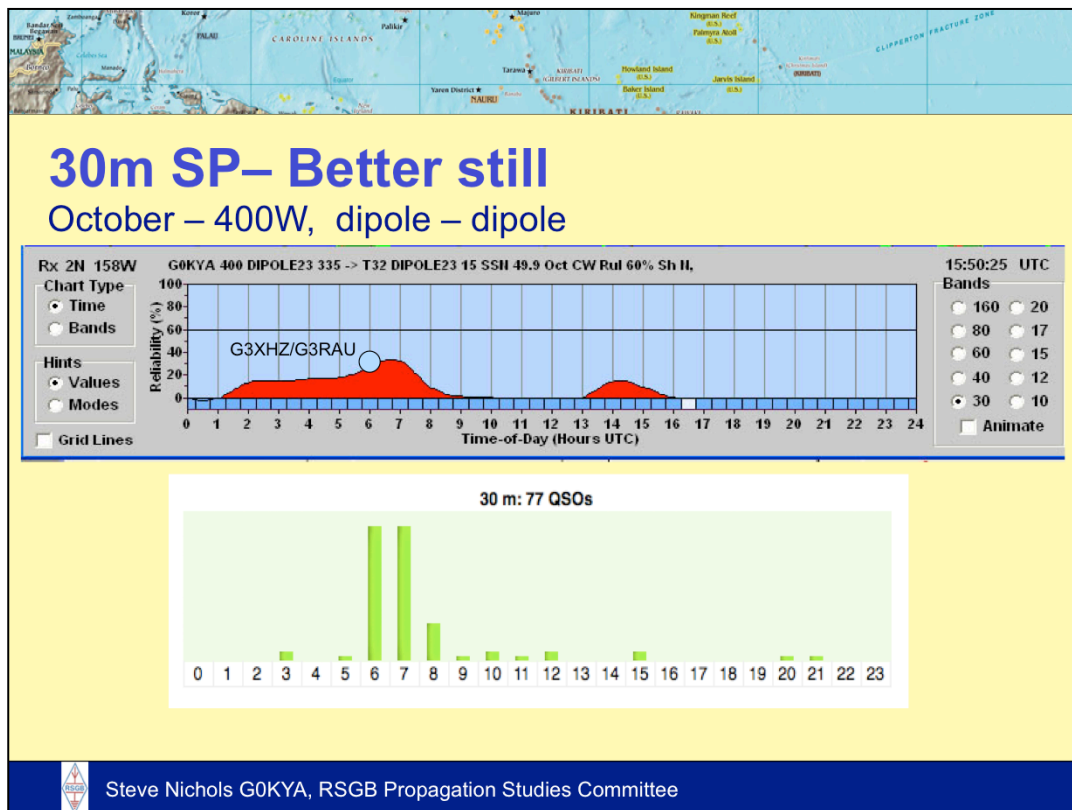


400W to a 3ele Yagi might sound unattainable, but this is what it took to get the Reliability factor up to something readable.

What I haven't factored is the short path gain caused by being so close to the sea and the "killer verticals" that may be in use at T32C. So just take this as a guide as to the best times!

No a bad correlation with actual, although they are shifted slightly later.

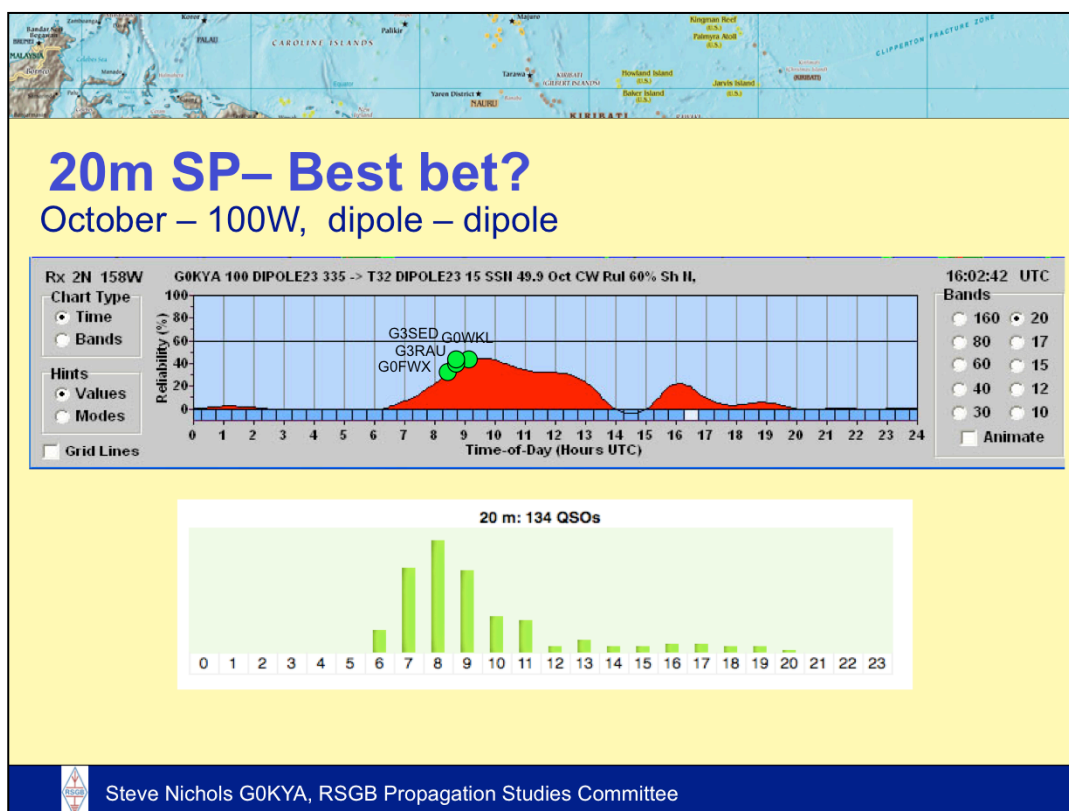




I have a good feeling about being able to work T32C on 30m. It is a data/CW-only band, so we don't have to fight it out with SSB users. Also, the band is slightly less popular than, say, 20m and many people do not have high-gain beams.

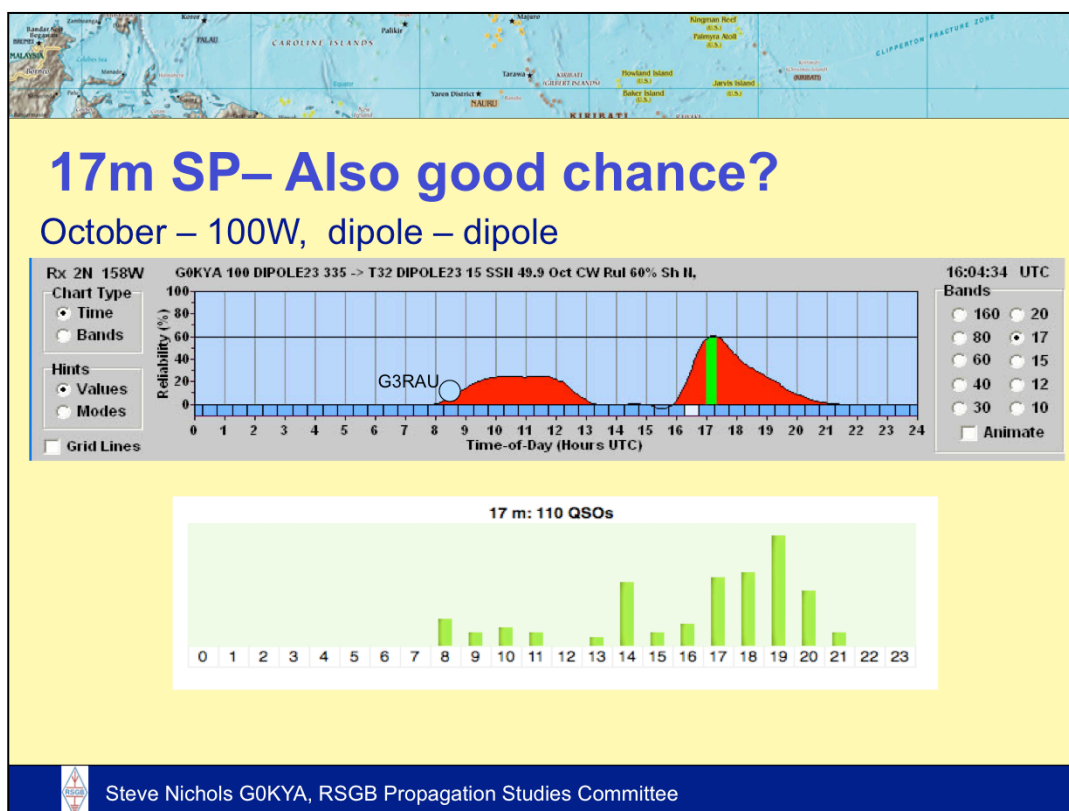
Having said that usable signals will probably not appear on the band until 0400 and will peak at about 0700-1000, fading out shortly after.

There is a slim chance that signals will remain throughout the day, as 10MHz is likely be above the lowest usable frequency (LUF) up to mid afternoon.



This band will be chocaful of stations trying to work T32C and perversely may prove to be one of the hardest bands to work them. The band will be open for a longer period than the lower bands, but will peak at around 0730 -1200UTC. Signals (if there at all) will then take a bit of dive before the possibility of another short opening around 1600-1700UTC.

Weak long-path signals are also a possibility on 20m, both between about 0600-1100UTC and 1600-1800UTC.

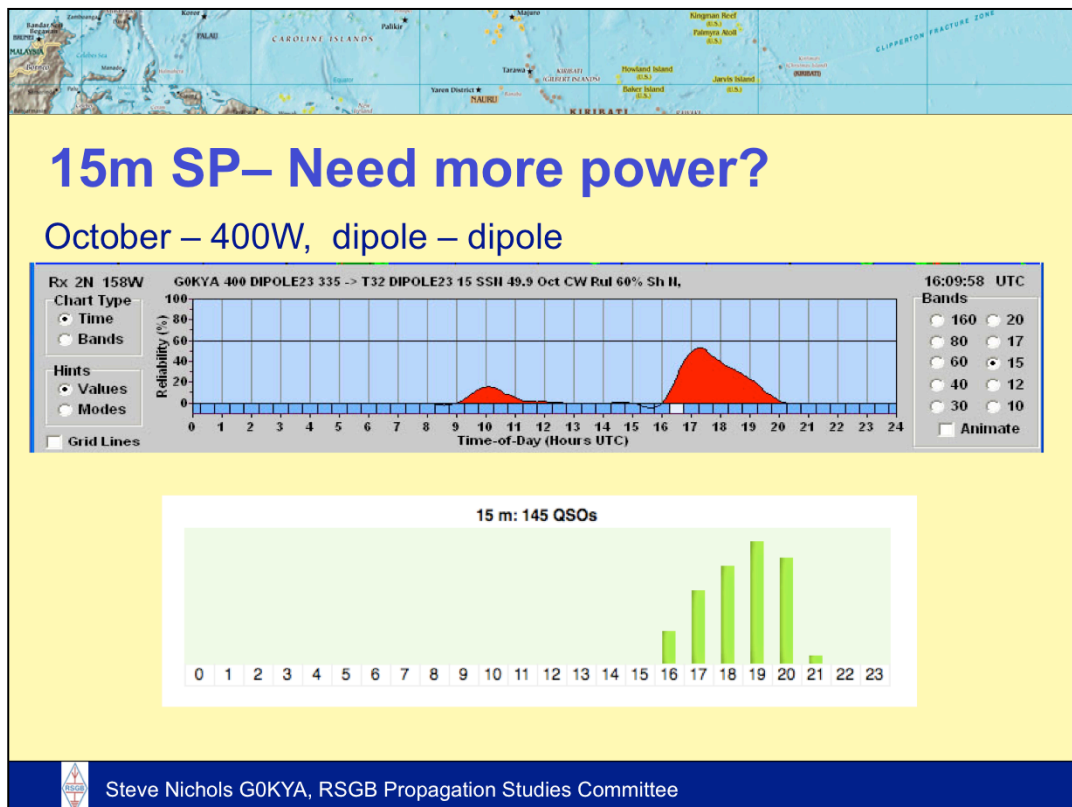


As we head up in frequency the band opportunities get shorter again, but that doesn't mean it isn't worth taking a look. Ionospheric D layer absorption gets less the higher we go and the bands become less noisy too. So don't dismiss 17m and up.

Look for short path openings between 0900-1200UTC and again from 1700-1900UTC.

We are often on the edge of the maximum usable frequency at the beginning and end of the slots so the signal could just appear out of the noise.

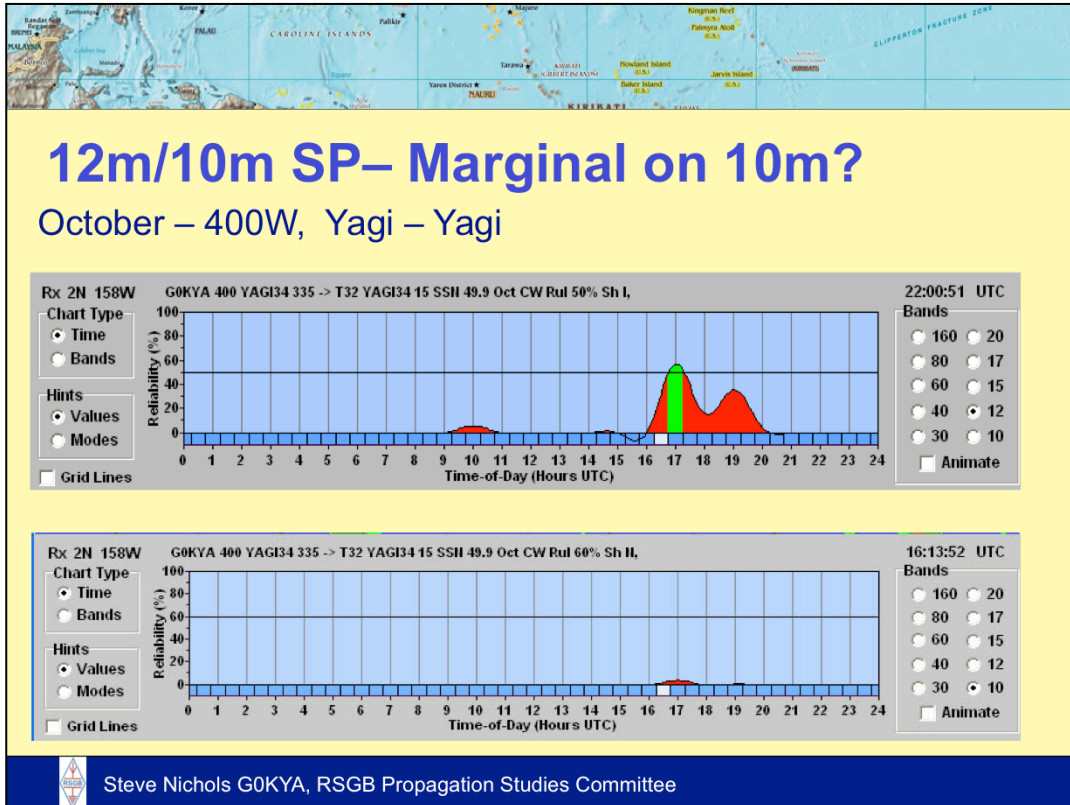
Long path also throws up some opportunities – around 0500-0630 for well-equipped stations and again at 1600-2000UTC.



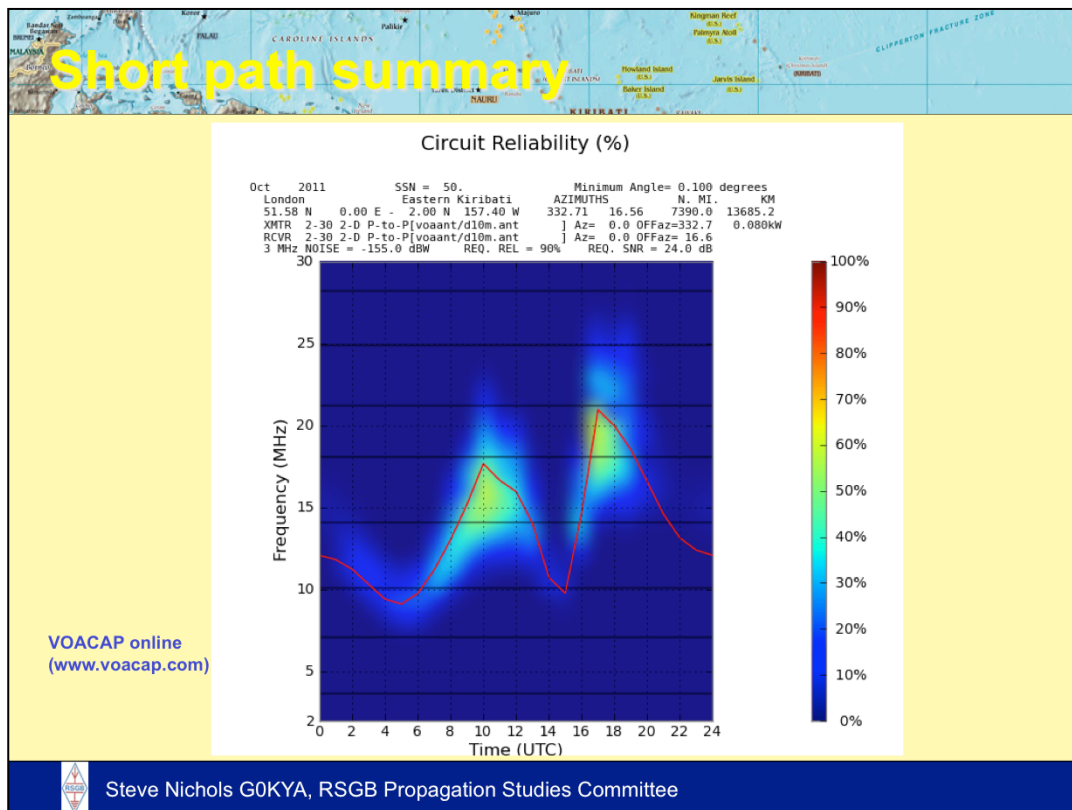
The problem with the higher bands is that the solar cycle has not really been playing ball – the solar flux has not really been high enough very often to provide good, reliable DX openings. It may therefore be a bit of a lottery.

Having said that we can narrow down any possible openings quite tightly.

0930-1200UTC may give you the best shot on short path, with 1600-1800UTC being the next best slot. Note the lull in the afternoon. Long path possibilities are from 0600 through to 0800UTC for well-equipped stations. With a further possible peak in the late afternoon/early evening.

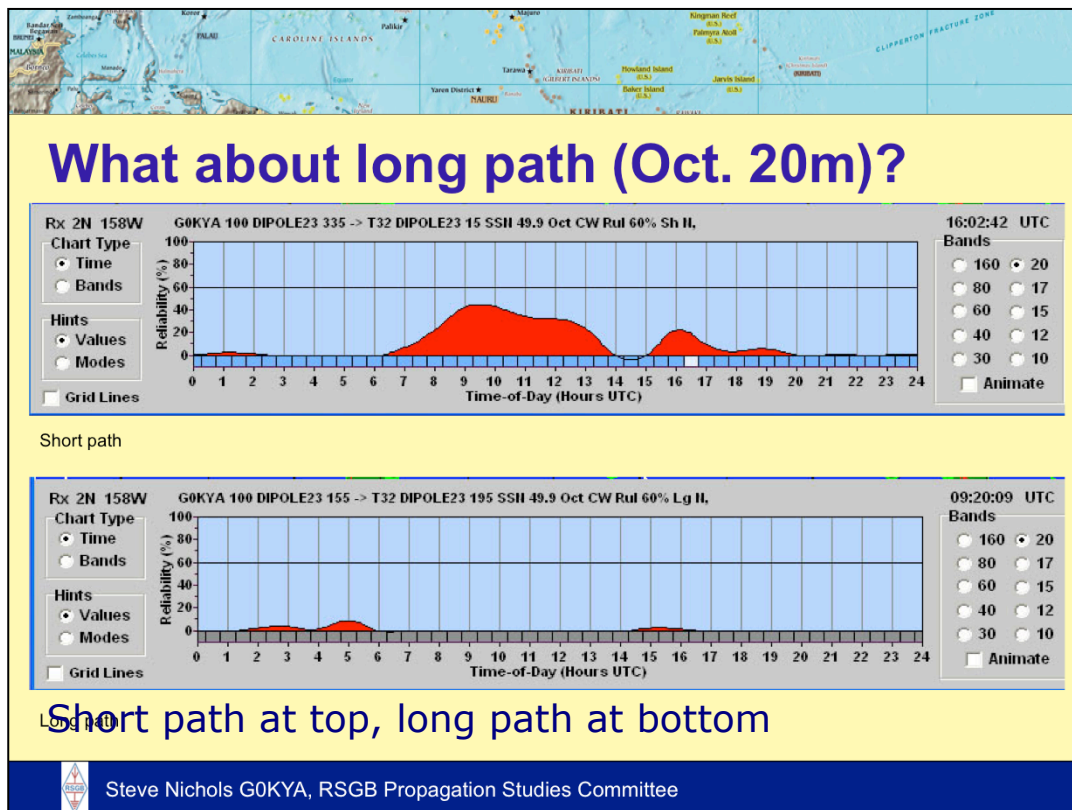


But see notes on Long Path later.

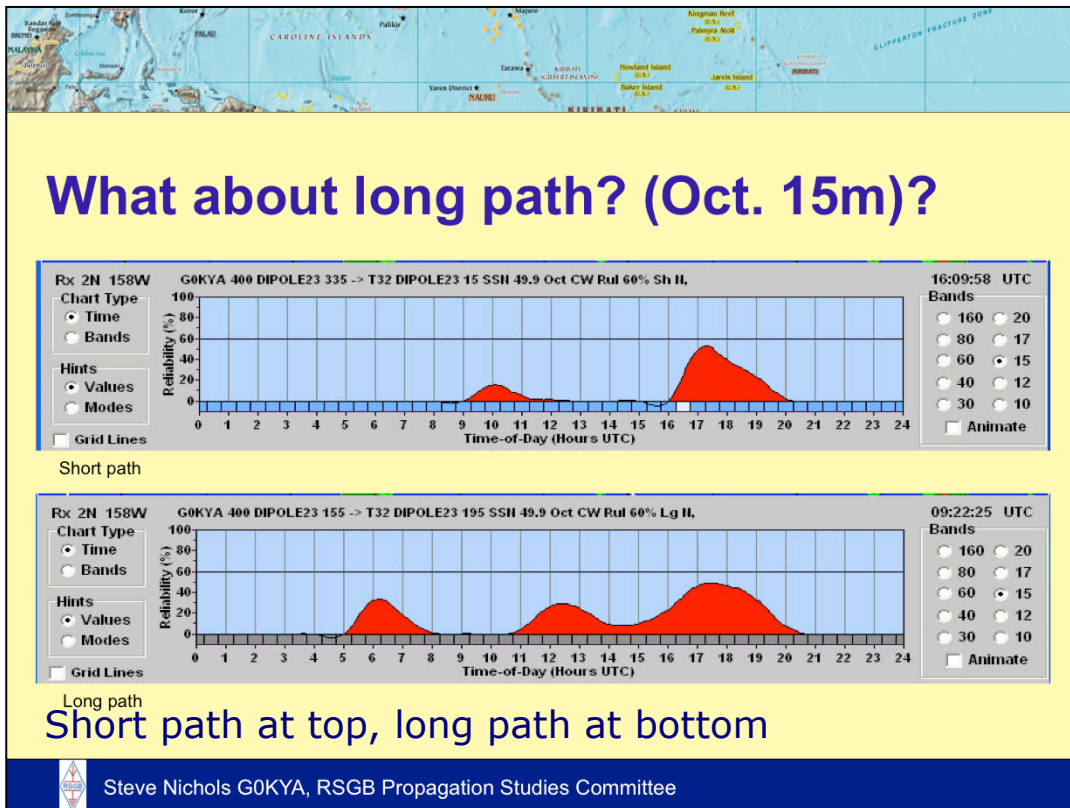


This is produced using VOACAP online

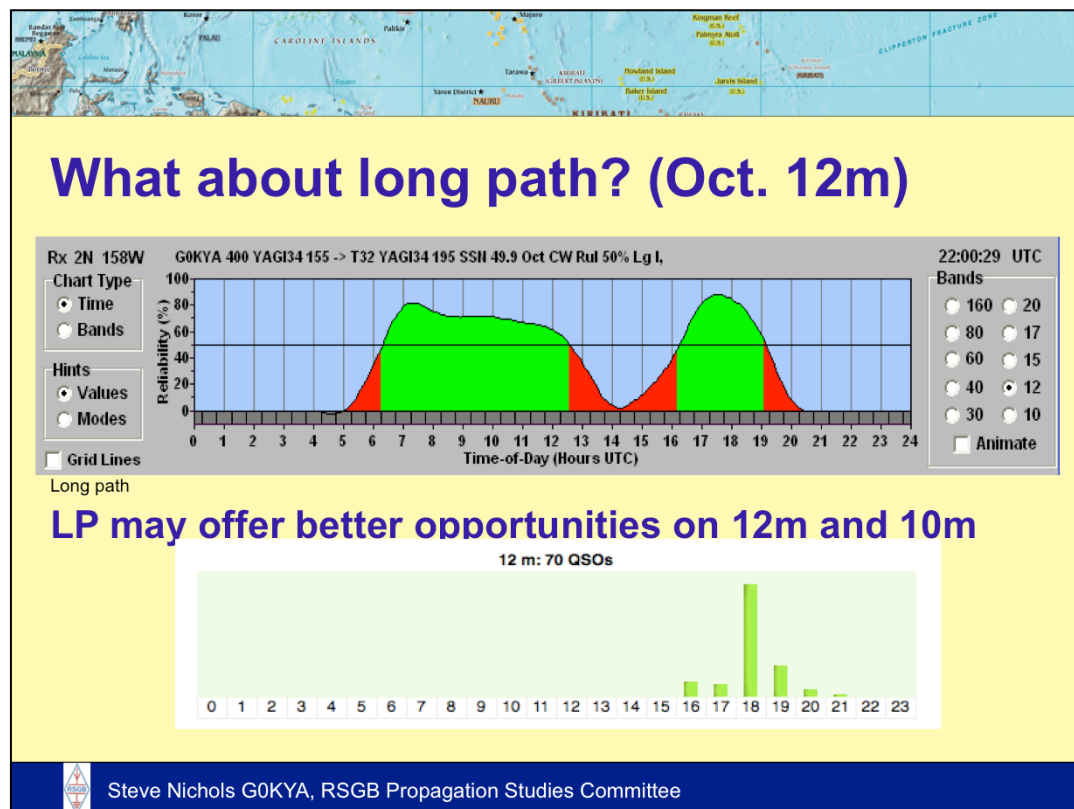




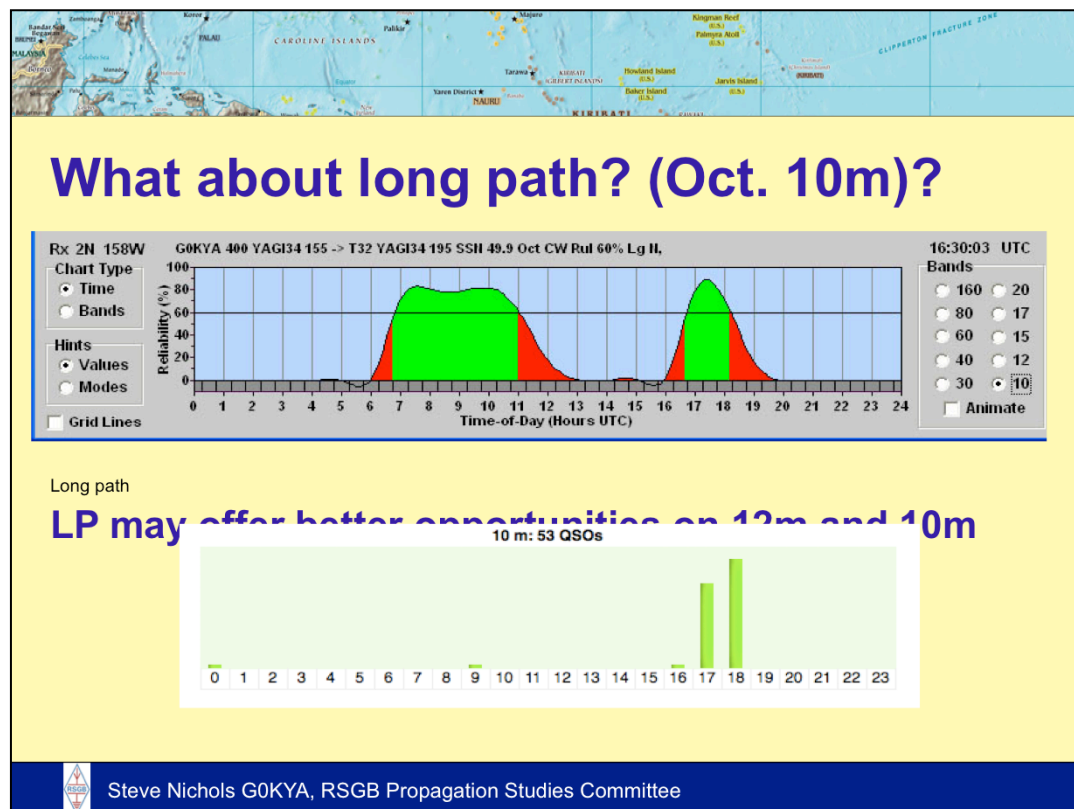
Long path on 20m gives a few added weak possibilities.



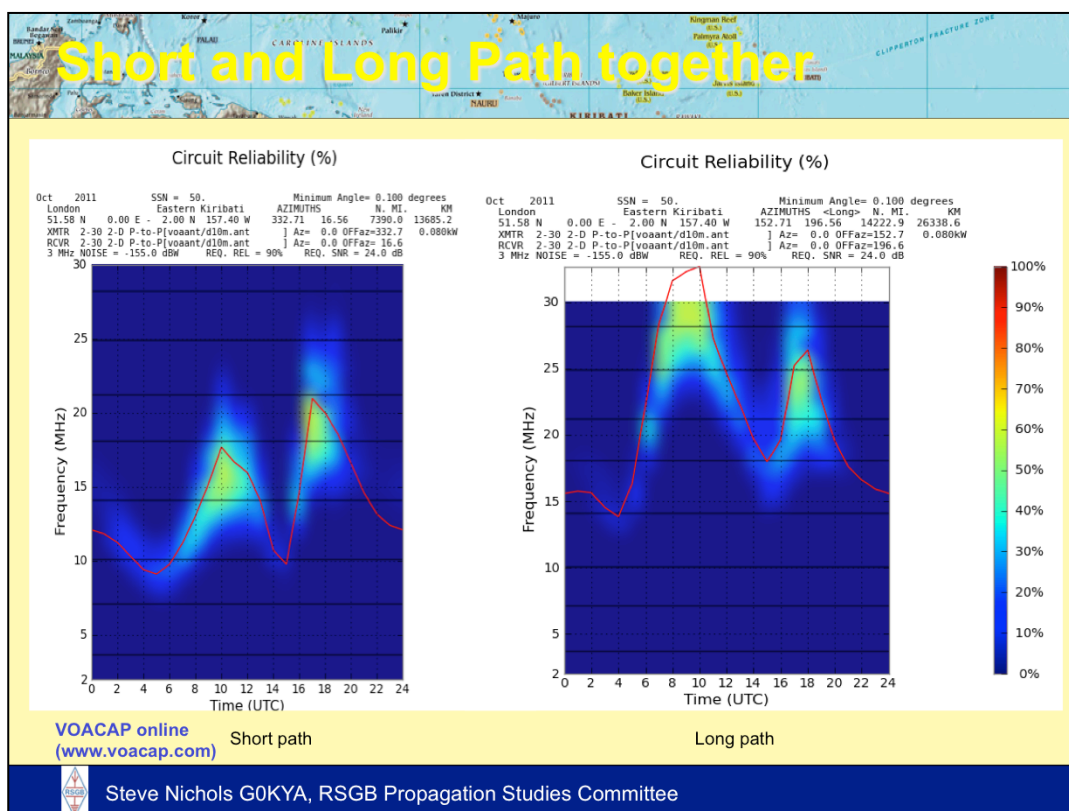
You possibly stand an equal or better chance long path on 15m than short path.



You may get much stronger signals on 12m and 10m via the long path. T32C will start to concentrate more on long path to the UK and will be installing a new high dipole.



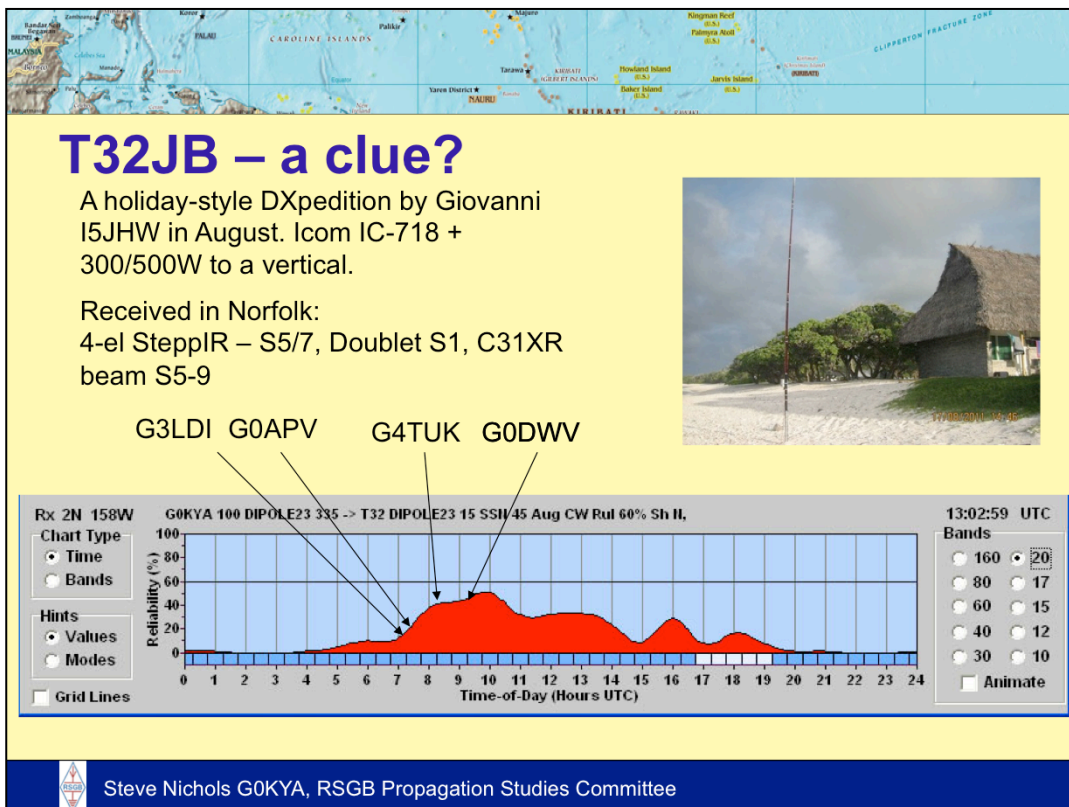
You may get much stronger signals on 12m and 10m via the long path.



Short path on left, long path on right. Produced using VOACAP online. Note the higher MUFs on long path, but overall greater probability of openings on short path.

However, any long path forecasts must bear in mind that the oceanside advantages on T32 will not apply going over the South Pole. The takeoff will be across some miles of flat scrubby island rather than straight out over the sea. And of course the distance is much greater.

So .... the long path predictions might be too enthusiastic.



In August a holiday-style DXpedition by Giovanni I5JHW activated T32JB. He used an Icom IC-718 + 300/500W to a vertical.

Four stations in Norfolk worked him on 20m and as you can see the times correspond quite well. What was obvious though was that each were well-equipped stations with beams/linears.

He was barely audible on a doublet at about 50ft. But hey, let's see who will work them first with a more basic antenna setup.





• T32C - [www.t32c.com](http://www.t32c.com)

- **ACE-HF - [www.mygeoclock.com/acehf/](http://www.mygeoclock.com/acehf/)**

• G0KYA – [www.g0kya.blogspot.com](http://www.g0kya.blogspot.com)

- **Propagation Studies Committee**  
- <http://www.rsgb.org/psc/>

