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SUBJECT	Extended use of SSB on the 30m band		
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Introduction

The current IARU Region 1 HF Bandplan [DV05_C4_Rec_31] has a footnote, which allows Radio Amateurs in African countries south of the equator to use SSB on the band segment 10,120 to 10, 140 MHz during local daylight hours. The South African Radio League is of the opinion that this footnote should be changed to allow around the clock operation of SSB on 10,120 to 10,140 MHz by stations in countries in Africa south of the equator.

Background:

The 10 MHz band is far better suited to provide regional communication than 7 MHz. Reports from South African radio amateurs indicate that daily QSOs between stations in Southern Africa are made with good signals and reception reports. The majority of traffic is between South Africa (ZS), Botswana, (A2) and Namibia (V5) with Malawi (7Q) often showing up. Malawi is the furthest north that QSOs are made. The band is well suited for emergency communications in the countries of the Southern African Development Community.

Propagation forecaster Ean Retief, ZS1PR carried out a detailed propagation study, which clearly shows that operation on 10 MHz will not cause interference in Europe.

Propagation Study: 30 Metre Band at Night

Background

South African amateurs have voluntarily refrained from operating on the 10 MHz band at night to avoid the risk of causing interference to any commercial users in Europe that are using this band.

This propagation study has been carried out to evaluate if there would be any significant propagation and if so, the level of signal strength that could be expected if SSB operation were to take place at night.

Possible Propagation

The only time that any propagation will take place will be in the "window" from 22:00 UTC to 04:00 UTC.

The highest signal levels and thus the highest possibility of harmful interference would be in the Southern Hemisphere spring during the months of September and October. The study was then concentrated over this period.

The most likely source of interference would come from the north of South Africa, especially ZS6, as (a) the most likely propagation will occur from here to southern Europe, while (b) ZS6 has the highest concentration of Amateur Radio operators in Africa, so most activity would be from this area.

Typical Station

The typical ZS station runs 100 Watt with a dipole antenna fairly low (circa 8 to 13 metres) above ground. This type of antenna installation produce a mostly high elevation angle signal and such a signal will not propagate long distances due to the many "hops" involved. The signals should be totally depleted and absorbed in the E-layer by the time it reached North Africa.

Thus for the initial study a station running 100 Watt was taken with a dipole antenna located one wavelength above the ground. This is very optimistic, as one wavelength would mean an antenna some 30 metres high! With the current regulations (and general anti-antenna sentiments), such an antenna would not be possible in urban areas and would also not be allowed in most peri-urban areas. Even on a remote farm such, an installation would require aircraft warning lights as specified in Civil Aviation regulations.

Analysis shows that such a station would propagate a just detectable signal from 23:00 UTC to 04:00 UTC. The highest signal strength should occur at 00:00 UTC when the signal will reach about 3 dB above ambient (atmospheric) noise in Southern Germany (Bavaria).

As a station with an antenna as described is most unlikely, it can be assumed that SSB signals from ZS stations would be of such a low level as to be negligible and be hardly noticeable to a commercial user. This would apply even if such a user has a very good receiving installation.

Super Station

As a second exercise, a study was done of a "Super" ZS station. A power output of 400 Watt and an antenna gain of 5,2 dB was taken (thus an ERP of 1,3 kW). It was further assumed that this station could generate signals at angles as low as 3 degrees above the horizon!

For the study, this station was located at various points in Southern Africa and the signal strengths in the northern hemisphere plotted so as to find a "worst case" scenario.

Once again, it was found that locations south of 30 degrees south are unlikely to propagate significant signals into Europe.

For instance, if such a station were to be located in Cape Town the strongest signal would be in the Mediterranean area. In Rome the signal from such a station would be 3 dB above the atmospheric noise and around the Balearic Islands some 5 dB above the atmospheric noise (in all cases man-made noise are assumed to be non-existent, which is normally not the case on 10 MHz.)

The "worst case" would be a station located in the far north of ZS6 close to the Zimbabwe border. Such a "super station" would propagate a signal of just under 10 dB into Bavaria around 02:00 UTC.

Around 03:00 UTC a weaker "opening" would occur to Brittany in north-western France for a short period.

Monitoring

During an extended visit to Gabon (TR8) in October 2001, I had ample opportunity to do monitoring in the 10 MHz spectrum.

Two locations were used. The first in an electrically quiet suburb of Port Gentil (00° 42" South: 8° 46" East) and the second in a remote location in the Rabi-Kounga region (2° S: 10° E).

No amateur signals were received on the 10 MHz band.

The region just above 10,150 MHz is extensively used commercially by trucking companies in Southern and East Africa.

Even there no signals from Southern Africa were ever heard. Only on two occasions, trucks were heard conversing with a base station apparently located in Kenya. This was in the early evening when propagation from that area could be expected.

As the location near the equator was about "halfway" to Europe it was expected that it would be a good indicator of signal levels "halfway" during their propagation to/from Europe. The lack of signals seems to confirm the theoretical propagation studies that no significant signals can be expected.

This is very different to for instance 14 and 21 MHz where signals from South Africa, Europe and India and later in the evening the USA abounds, as propagation prediction indicates it should.

I am again in Gabon at the time of writing (Jan 2002) and there is mostly high summer static on the 10 MHz band. Even the 31-metre broadcast band that was excellent in October/November is adversely affected.

It can thus be seen that monitoring confirms propagation predictions.

Conclusion

From the above it can be seen that signals emanating from Southern Africa are unlikely to cause any significant interference problems in Europe.

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Recommendation

It is recommended that the footnote to the 10 MHz band be changed to allow Radio Amateurs in African countries south of the equator to use SSB on 10,120 to 10,140 MHz twenty fours hours a day.

The proposed wording of the footnote is as follows:

- The band segment 10120 kHz to 10140 kHz may be used for SSB transmissions in the area of Africa south of the equator.