OPERA DYNAMIC

The only measure of a data mode is energy used /data transferred and the reliability of the recovered data. One is constrained by the laws of physics, the other by the ability of the designer.

Comparisons of the Opera system, with other modes, converge on power levels and omit to recognise the concept of energy consumed by the process.

'If the energy has not been used, then it cannot have been wasted'

The Opera data system uniquely uses single carrier OOK [on /off] keying, with a duty cycle close to 50%, hence, for the same time, only 50% of the energy is used compared to a FSK Frequency Shift Keyed mode, with a 100% duty.

Double the energy or Double the time is needed to give a balanced comparison .

Opera Dynamic: Introduces the first, adaptive multi mode Beacon decoding/detection system , seamlessly taking over from the Opera data decoder and dynamically configuring the low level detector.

With the introduction of ***Opera Dynamic***, It's now possible to perform a direct, 'one to one' comparison with compatible low s/n detection system.

To quote from the DF6NM OPDS help files,

''For a coherent signal, the Opds-32 threshold should be around -50 dBOp, which in theory is 8 dB better than WSPR-15 and 11 dB better than standard Opera-32.''

To ascertain the validity of the statement, three direct comparisons where tested

1 Level of false detections / time

2 Consistency and accuracy of reported s/n level

3 Limits of detection

1. LEVEL OF FALSE DETECTIONS / TIME

To substantiate the detection's presented by the two systems

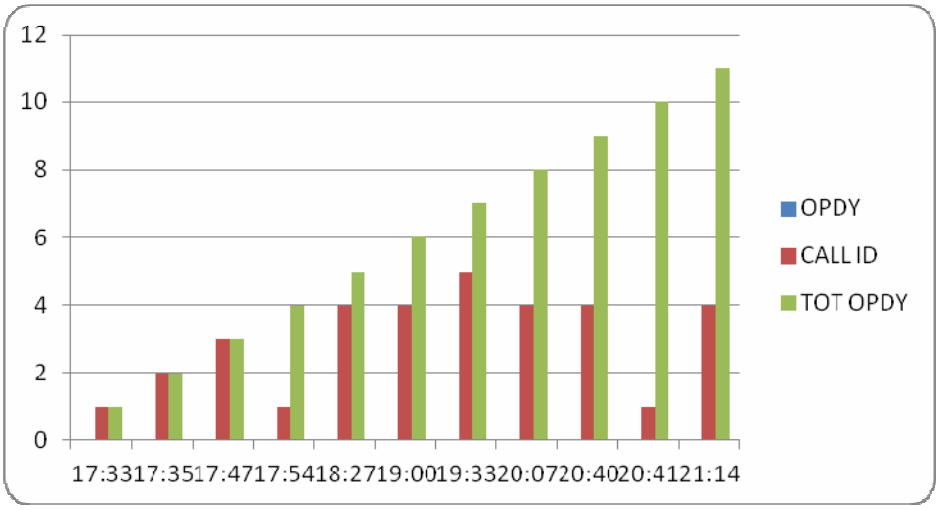
Both systems where configured and run simultaneously over a period of 4 hours on the same hardware, being subjected to a live Ae off air noise on a clear channel, no traffic was passed during the test.

Opera Dynamic

Produced **zero** false detections from the Opera data mode and **zero** from the Opera Dynamic.

DF6NM Opds

DF6NM Opds was observed to detect a total of five unique call signs during the period of four hours , with a repetition pattern display by the graphic. Cumulating in a total of eleven false detections in the 4 hour period.



Plot of unique Call signs / Total detections

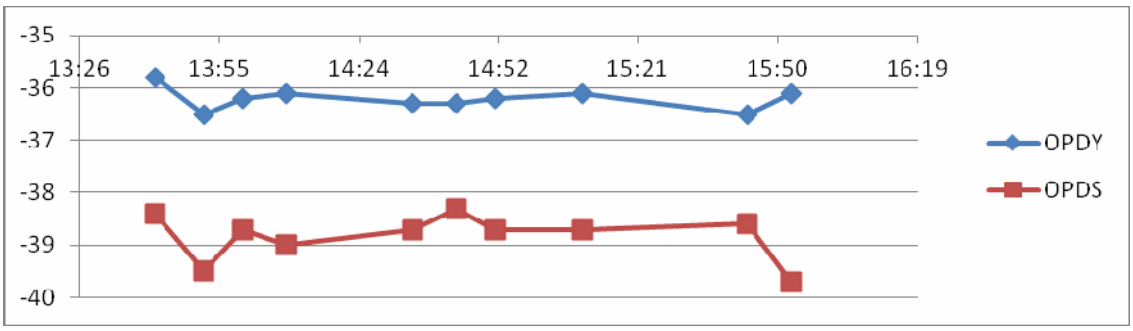
2. LOW LEVEL S/N CALIBRATION /STABILITY

Calibrated test files where produced to give repeatable observations of system performance, both systems being tested simultaneously on the same hardware

10 cycle Low level detection test @ nominal -36 dB s/n

Opera Dynamic gave a reliable detection level, just under -36 dB.

DF6NM Opds detected levels showed 3 / 4d B lower at the same decode points of Opera Dynamic and displayed a far wider range of inconsistency.



3. ULTIMATE LIMIT OF DETECTION

Repeating the test at a level of -0.5 dB lower s/n
Resulted in *detections only by the* ***Opera dynamic system.***

Hence it was demonstrated that, ***Opera OP8 Dynamic***, detection floor, stands at **0.5 dB lower** than the DF6NM Opds system.

This represents a s/n detection, by Opera Dynamic of ***5 dB lower*** than the OP8 data mode, ***and not the -11 dB*** as intimated in the OPDS description.

4. CONCLUSION

1 The supposed advantage of 11 dB over the Opera system was un-substantiated.

The minimum detection level of the Opera Dynamic system exceeds that DF6NM Opds by 0.5 to 1 dB with a gain of 5 dB over the Op data mode.

2 The Calibration of the DF6NM Opds system is misleading when compared to the Opera system [calibrated to sim-path], with up to a 4 dB positive error.

3 The level of false detections in a four hour test, totalled 11 with 5 unique callsigns, as to the value of such a system, is out side the scope of this comparison and is left to the user to decide .