

**Abstract****Improvements in and relating to Receivers for DPSK Signals**

There is provided an apparatus and method for performing unique word  
5 detection and frequency offset estimation for a receiver for DPSK signals  
comprising in-phase I and quadrature Q components for a plurality of symbols  
k. The apparatus comprises: a differential detector for performing differential  
detection of a received signal over a given symbol span; a frequency corrector  
for performing an initial correction of I and Q using a previously estimated value  
10 of the frequency offset; accumulators for averaging I and Q for each symbol k  
over a given number K of symbols, where K is the number of symbols in the  
unique word to be detected; a frequency offset estimation block for calculating  
an estimate of the frequency offset from averaged I and averaged Q; and a  
unique word detection block for determining, from differentially detected I,  
15 differentially detected Q, averaged I and averaged Q, whether or not the unique  
word is present in a received signal.

**Figure for publication – Figure 4****\*162162\*****\*G00002\***