

CLAIMS

1. An apparatus comprising:
 - means (912) for determining usable subcarriers and guard subcarriers based on a configurable operating bandwidth for a wireless communication system, and characterised by:
 - the bandwidth being configurable by use of variable guard bands, one on each of the two sides of the operating bandwidth, wherein the guard bands are varied by selecting different numbers of subcarriers; and wherein the guard bands comprise guard bands of unequal lengths; and
 - means (914) for performing processing for a transmission sent on the usable subcarriers.
2. The apparatus of claim 1, wherein the means for performing processing for the transmission comprises:
 - means for mapping modulation symbols to the usable subcarriers,
 - means for mapping zero symbols to the guard subcarriers, and
 - means for generating Orthogonal Frequency Division Multiplexing (OFDM) symbols based on the mapped modulation symbols and zero symbols.
3. The apparatus of claim 1, wherein the means for performing processing for the transmission comprises:
 - means for obtaining received symbols from the usable subcarriers,
 - means for discarding received symbol from the guard subcarriers, and
 - means for processing the received symbols from the usable subcarriers to recover data sent in the transmission.
4. An apparatus according to claim 1 comprising:
 - a processor configured to determine usable subcarriers and guard subcarriers based on the configurable operating bandwidth for the wireless communication system, and to perform processing for the transmission sent on the usable subcarriers; and
 - a memory coupled to the processor.
5. The apparatus of claim 4, wherein the processor is configured to map

modulation symbols to the usable subcarriers, to map zero symbols to the guard subcarriers, and to generate Orthogonal Frequency Division Multiplexing (OFDM) symbols based on the mapped modulation symbols and zero symbols.

6. The apparatus of claim 5, wherein the processor is configured to generate the OFDM symbols based on a fast Fourier transform (FFT) size and a cyclic prefix length that are independent of the operating bandwidth.

7. The apparatus of claim 4, wherein the processor is configured to generate output samples at a sample rate that is independent of the operating bandwidth.

8. The apparatus of claim 4, wherein the processor is configured to obtain received symbols from the usable subcarriers, to discard received symbol from the guard subcarriers, and to process the received symbols from the usable subcarriers to recover data sent in the transmission.

9. The apparatus of claim 8, wherein the processor is configured to obtain received samples at a sample rate that is independent of the operating bandwidth, and to process the received samples to obtain the received symbols for the usable and guard subcarriers.

10. The apparatus of claim 1, wherein the wireless communication system is associated with a design bandwidth corresponding to K total subcarriers, and wherein the operating bandwidth corresponds to N usable subcarriers, where $K > N > 1$.

11. The apparatus of claim 4, wherein the wireless communication system is associated with a single design bandwidth and the operating bandwidth is selected from a range of bandwidths supported by the design bandwidth, and wherein the processor is configured to perform processing for the transmission based on a set of parameter values for the design bandwidth.

12. The apparatus of claim 4, wherein the wireless communication system is associated with multiple design bandwidths, each design bandwidth supporting a respective range of bandwidths, and wherein the processor is configured to perform

processing for the transmission based on a set of parameter values for a design bandwidth supporting the operating bandwidth.

13. The apparatus of claim 4, wherein the wireless communication system is associated with first and second design bandwidths, and wherein the processor is configured to perform processing for the transmission based on a first set of parameter values for the first design bandwidth if the operating bandwidth is within a first range, and to perform processing for the transmission based on a second set of parameter values for the second design bandwidth if the operating bandwidth is within a second range that is lower than the first range.

14. The apparatus of claim 1, wherein the operating bandwidth is determined based on frequency bandwidth available for the wireless communication system.

15. The apparatus of claim 1, wherein the operating bandwidth is determined based on a spectral emission mask for the wireless communication system.

16. The apparatus of claim 1, wherein the operating bandwidth is selected from a plurality of bandwidths associated with different numbers of guard subcarriers and a fixed Orthogonal Frequency Division Multiplexing (OFDM) symbol duration.

17. A method comprising: determining (812) usable subcarriers and guard subcarriers based on a configurable operating bandwidth for a wireless communication system, and characterised by:

the bandwidth being configurable by use of variable guard bands, one on each of the two sides of the operating bandwidth; wherein the guard bands are varied by selecting different numbers of subcarriers wherein the guard bands comprise guard bands of unequal lengths; and performing (814) processing for a transmission sent on the usable subcarriers.

18. The method of claim 17, wherein the performing processing for the transmission comprises

mapping modulation symbols to the usable subcarriers,
mapping zero symbols to the guard subcarriers, and

generating Orthogonal Frequency Division Multiplexing (OFDM) symbols based on the mapped modulation symbols and zero symbols.

19. The method of claim 17, wherein the performing processing for the transmission comprises
 - obtaining received symbols from the usable subcarriers,
 - discarding received symbol from the guard subcarriers, and
 - processing the received symbols from the usable subcarriers to recover data sent in the transmission.
20. An apparatus according to claim 4 :
 - wherein the processor is configured to determine usable subcarriers and guard subcarriers based on a configurable operating bandwidth for a wireless communication system, the operating bandwidth selected from a plurality of bandwidths associated with different numbers of guard subcarriers and a fixed Orthogonal Frequency Division Multiplexing (OFDM) symbol duration, and to perform processing for a transmission sent on the usable subcarriers, the transmission comprising OFDM symbols having the fixed duration.
21. A computer readable storage medium carrying a computer program stored thereon, said program comprising computer executable instructions adapted to perform the method steps of any of Claims 17 to 19 when executed by a processing module.