

# GNSS Multiplex Binary Offset Carrier (MBOC)

## Background

A requirement to improve the accuracy of Global Navigation Satellite Systems (GNSS) has determined a technique using modulation of the satellites transmitted baseline signal which improves the positional accuracy of Global Positioning Systems (GPS). The Multiplex Binary Offset Carrier (MBOC) spreading modulation technique controls the power spectral density at the fundamental frequency and of associated side-lobes across the bandwidth of a transmitted GPS signal. By controlling the side lobes power spectra (increasing) whilst maintaining the power levels at the central frequency, interference levels are reduced. The reciprocal de-modulation technique can then be used by GPS receivers to improve location accuracy.

## Technology

The Dstl MBOC spreading modulation technique combines two Binary Offset Carrier (BOC) signals to produce the MBOC signal. Each BOC signal is produced by multiplying a square sub-carrier signal by a higher frequency rectangular sub-carrier. The MBOC signal generated (MBOC(6,1,1/11)) is the result of multiplexing a wideband BOC(1,1) signal with a narrowband BOC(1,6) signal in such a way that 1/11 of the power is allocated to the high frequency component.

The MBOC spreading modulation has been adopted as the baseline for the EU Galileo and USA Navstar signals and is designed to ensure compatibility between the two systems.

The novelty of the invention lies in the simple process adopted to create the MBOC signals, which can be either generated as Composite BOC (CBOC) signals, as adopted for Navstar or by Time Multiplexing(TMBOC) signals, as adopted for Galileo.

## Benefits

- Improved location accuracy
- Improved interoperability and compatibility between Navstar GPS III & Galileo
- Improved signal tracking performance
- Increased satellite transmitter power output

## Applications

- High accuracy Galileo/ GPS III receivers
- Terrestrial transmitter/receiver devices

## Intellectual Property

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