GPS-Galileo Working Group A (WG A)
Recommendations on L1 OS/L1C Optimization

1.   BACKGROUND

The purpose of this document is to recommend a jointly optimized signal for the Global Positioning System (GPS) L1 Civil (L1C) and the Galileo L1 Open Service (OS), consistent with Article 11, Paragraph 7 of the June 2004 "Agreement on the Promotion, Provision and use of Galileo and GPS Satellite-Based Navigation Systems and Related Applications" (the "Agreement").

2.   SPREADING MODULATION DESCRIPTION

We intend to design signals for L1 OS and L1C that have an identical power spectral density (PSD) when computed using all signal components including pilot and data. This normalized (unit power) PSD (hereinafter "the MBOC PSD"), specified without the effect of bandlimiting filters and payload imperfections, is given by

$$\Phi(f) = \frac{10}{11} BOC(1,1) + \frac{1}{11} BOC(6,1)$$

where $BOC(m,n)$ is the normalized PSD of a sine-phased Binary Offset Carrier modulation with subcarrier frequency $m \times 1.023$ MHz and spreading code chip rate $n \times 1.023$ MHz.

We understand that the Galileo and GPS systems may employ different time series, including different spreading symbols, to produce the MBOC PSD. Nonetheless, it is desirable for both Galileo and GPS to transmit time series using the same spreading symbols, and spreading codes from the same family.

Following the meeting in Stockholm on the 20-22nd of March, it was established that, when implemented by both GPS and Galileo, the MBOC PSD is fully compliant with the criteria of the Agreement. In addition, WG A established that the performance of MBOC signals surpasses that of CBCS* as previously defined.
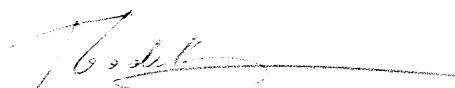
3.   RECOMMENDATIONS

3.1 WG A recommends that no further consideration be given to CBCS*.

3.2 WG A recommends that selection of the MBOC PSD completes the modulation optimization process described in Article 11, Paragraph 7 of the Agreement.

3.3 WG A recommends the following actions:

   a) Each party promptly informs the other party if it identifies an issue that prevents the implementation of the MBOC PSD.

   b) The parties jointly prepare and exchange notifications of their intent to implement the MBOC PSD in accordance with the notification procedures described in Article 11 of the Agreement as soon as possible.

JÉRÉMIE GODET
European Community WG A Co-Chair

Date   22, March 2006

MARK CREWS, Col, USAF
United States WG A Co-Chair

Date   22 March 2006