2 9 SEP 2006

MEMORANDUM FOR GPS USERS AND USER EQUIPMENT (UE) MANUFACTURERS

FROM: 50 SW/CC and GPS WG/CC

SUBJECT: PRN 12 and 32 Return To Ops and WAGE Impacts

1. Presently, the GPS constellation contains under 30 operational satellites and may grow to a size of up to 32 satellites based on satellite longevity and scheduled replenishment launches. Since GPS reached full operational capability on 17 July 1995, the GPS constellation has reached a size of 30 satellites twice. Our recent launch on 25 September 2006, plus our planned next launch in November will produce the largest-ever GPS constellation of 31 satellites assuming no additional GPS satellites are decommissioned.

2. The GPS constellation size is currently limited to 32 satellites based on 32 unique satellite-identifier codes called pseudo-random noise (PRN) codes or "PRNs" for short. Each satellite broadcast signal has an embedded PRN code for GPS receiver processing. Only 32 operational PRNs are listed in the technical interface specification, IS-GPS-200. This particular specification has successfully served GPS equipment manufacturers since they have effectively used this spec for multiple GPS receiver designs.

3. Although future versions of our interface spec, IS-GPS-200, will accommodate a larger constellation for the next generation GPS, the most pressing concern is with potential impacts to existing fielded GPS receivers that may not properly account for up to 32 operational PRNs. Because a top priority is to minimize the impact to GPS equipment that may not have accounted for a constellation size of up to 32 satellites, the 50th Space Wing and GPS Wing requests that vendors and managers of GPS user equipment and GPS integrated platforms evaluate the impact to their equipment of processing more than 30 PRN codes.

4. An important set of GPS military users employ the encrypted Wide-Area GPS Enhancement (WAGE) message for improved accuracy. These users may have a PRN limit of 30 in their implementation; therefore, we are concerned with the impact of broadcasting more than 30 PRNs to WAGE-enabled receivers.

5. Another important set of GPS users have experienced a problem with PRN #32 related to the 5-bit PRN code allocation and subsequent processing. For example, some older GPS receivers (i.e., Precision Lightweight GPS Receiver (PLGR) and Miniaturized Airborne GPS Receiver (MAGR)) represented PRN #32 as "00" in the display or on the serial port. The 50th Space Wing and the GPS Wing notified users of this problem in order to take corrective actions. Even so, PRN #32 has not been broadcast since the early 1990s. Hence, we are concerned with the impact to users by the reactivation of PRN #32. Platform integrators that adhered to MIL-STD-1553 multiplex bus interface specification, IS-GPS-059, should not experience any issues with

the reactivation of PRN #32. For platforms that integrate, embed or depend on GPS for PNT data, please ensure that the device is compliant with IS- GPS-059.

6. In summary, we need to know specifically:

- Do you rely on WAGE and, if so, would your mission be jeopardized without WAGE?
- Will broadcasting all PRNs (1 thru 32) cause any issues with your systems?

We want to continue to provide the world's best precision navigation and timing. In order to do so, it is important that we prepare to operationalize all 32 PRNs. To help us ensure we identify and minimize impacts to users, please respond to the questions above and contact the 50 SW GPS Operations Center (GPSOC) by 20 Oct 06 at 719-567-2541 or email: "GPS_Support@schriever.af.mil" on any potential impacts. Major Erin Carraher is the GPS Wing point of contact and can be reached at (310) 653-3154, "Erin.Carraher@losangeles.af.mil". Thank you in advance for your assistance.

JAMES C. HUTTO, JR.
Colonel, USAF
Commander, 50th Space Wing

WESLEY A. BALLENGER, JR.
Colonel, USAF
Commander, Global Positioning Systems Wing