

**SUBJECT:** Key West Florida DGPS Site Operational Assessment

**DATE:** 22-26 February 2011

**INSPECTOR:** LT Christian Hernaez

**PURPOSE:** Validate advertised DGPS coverage of the Key West DGPS site. Validate required RTCM message delivery. Test differential correction accuracy versus a predetermined survey monument.

**EQUIPMENT:** DNAV 212 INVICTA Receiver  
Hemisphere R110 GPS Receiver  
MBA-2 Receive Antenna

**PARAMETERS:**

Frequency	286 KHz
Forward Output Power	500W
Transmission Rate	100 baud
Field Strength/Range	75 $\mu$ V/m (37.5dB $\mu$ V/m) at 204 km

**SITE PHOTO:**



## RESULTS

### Signal Strength:

DNAV readings were taken at 204 km from the Key West DGPS site on both east and west coasts of Florida; Miami and Naples, respectively. At both points, the signal strength and signal-to-noise ratio (SNR) were satisfactory in meeting the advertised coverage. Additionally, the measured coverage closely matches the predicted coverage plot of Key West. In figure 1 below, the range ring is set to the 204 km advertised range. Green points represent areas of satisfactory signal strength and SNR, while red points represent areas of unsatisfactory signal strength or SNR.

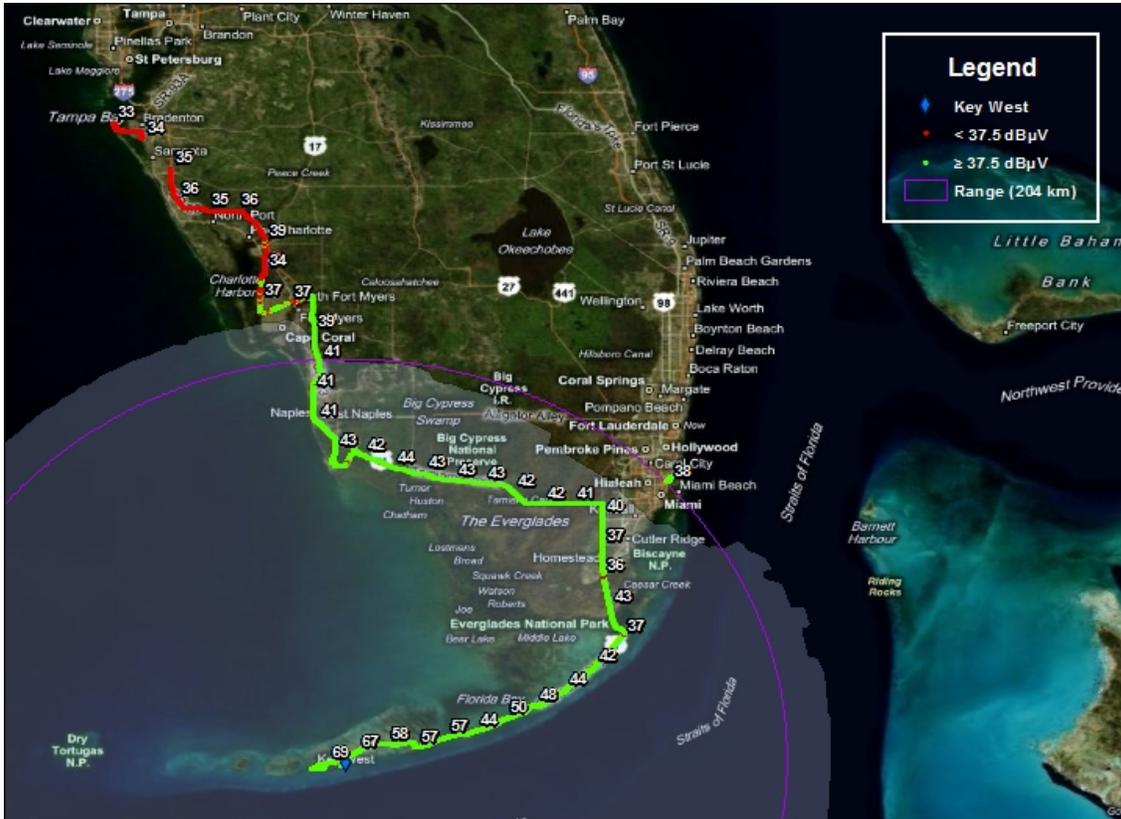


Figure 1.

### Far-Field Signal Strength Reading 1:

Receiver:	DNAV 212 INVICTA
Antenna:	MBA-2
Position	25° 51.892'N 080° 10.2633'W
Signal Strength	38dBµV/m
SNR	14

### Far-Field Signal Strength Reading 2:

Receiver:	DNAV 212 INVICTA
Antenna:	MBA-2
Position	26° 25.36152'N 081° 46.4496'W
Signal Strength	41dBµV/m
SNR	12

**RTCM Message Verification:**

RTCM message were collected from both sides of the DGPS site utilizing a Hemisphere R110 Receiver. All required message traffic was confirmed. A Type 5 message was observed while recording Side B.

Side A

<b>Type 3</b>	X
<b>Type 7</b>	X
<b>Type 9</b>	X
<b>Type 16</b>	X
<b>Misc</b>	N/A

Side B

<b>Type 3</b>	X
<b>Type 7</b>	X
<b>Type 9</b>	X
<b>Type 16</b>	X
<b>Misc</b>	Observed Type 5

**Accuracy Validation:**

Data was collected for 15 minutes on each side. Positional data was then averaged and compared to the actual monument position to check the horizontal accuracy of the correction.

<b>NGS Monument ID:</b>	<b>BBCD42</b>
Monument LAT:	27° 25' 44.26947" N
Monument LON:	082° 30' 18.58988" W

Side A

<b>Averaged LAT:</b>	27° 25' 44.29752" N
<b>Averaged LON:</b>	82° 30' 18.60486" N
<b>Distance from DGPS Site:</b>	327.79 km
<b>Distance from Monument:</b>	0.96 m (3.15 feet)
<b>Bearing from Monument:</b>	334.61°

Side B

<b>Averaged LAT:</b>	27° 25' 44.3016" N
<b>Averaged LON:</b>	82° 30' 18.60822" N
<b>Distance from DGPS Site:</b>	327.79 km
<b>Distance from Monument:</b>	1.11 m (3.65 feet)
<b>Bearing from Monument:</b>	333.16°

**OPERATIONAL RECOMMENDATION:** Analysis of coverage is consistent with current OPORDER and predicted coverage plot. No changes/updates required at this time.