

SUBJECT: Brunswick Maine DGPS Site Operational Assessment

DATE: 18-22 April 2011

INSPECTOR: LT Bion Holbrook

PURPOSE: Validate advertised DGPS coverage of the Brunswick 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	316 KHz
Forward Output Power	750W
Transmission Rate	100 baud
Field Strength/Range	75 μ V/m (37.5dB μ V/m) at 322 km

SITE PHOTO:



RESULTS

Signal Strength:

DNAV readings were taken at the Brunswick DGPS site on both the east and west coverage points from Rhode Island to Canada, respectively. At all 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 Brunswick. In figure 1 below, the range ring is set to the 322 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: Side A

Receiver:	DNAV 212 INVICTA
Antenna:	MBA-2
Position	44° 20' 38.169"N -69° 47' 34.0002"W
Signal Strength	51dBµV/m
SNR	20

Far-Field Signal Strength Reading 2: Side B

Receiver:	DNAV 212 INVICTA
Antenna:	MBA-2
Position	44° 20' 38.169"N -69° 47' 34.0002"W
Signal Strength	52dBµV/m
SNR	20

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.

Side A

Type 3	X
Type 7	X
Type 9	X
Type 16	X
Misc	N/A

Side B

Type 3	X
Type 7	X
Type 9	X
Type 16	X
Misc	N/A

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.

NGS Monument ID:	LOBSTER
Monument LAT:	44° 20' 38.15991" N
Monument LON:	069° 47' 33.99893" W

Side A

Averaged LAT:	44° 20' 38.184"N
Averaged LON:	-69° 47' 34.0794"W
Distance from DGPS Site:	51.99 km
Distance from Monument:	1.9 m (6.32 feet)
Bearing from Monument:	346.12

Side B

Averaged LAT:	44° 20' 38.184" N
Averaged LON:	-69° 47' 34.0794" N
Distance from DGPS Site:	51.99 km
Distance from Monument:	1.9 m (6.32 feet)
Bearing from Monument:	346.12

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