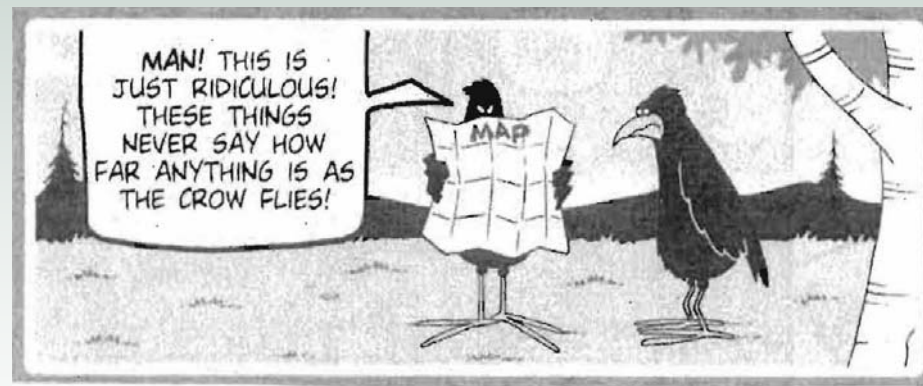




National Park Service GPS Program





“It’s always been like that.”





You think that you have masking problems!



N41.439266 W124.039133 M

Apr 19, 2001 7:43pm



GPS in the National Park Service

wide variety of users and requirements





GPS in the National Park Service

wide variety of users and requirements





Hydrographic Surveying



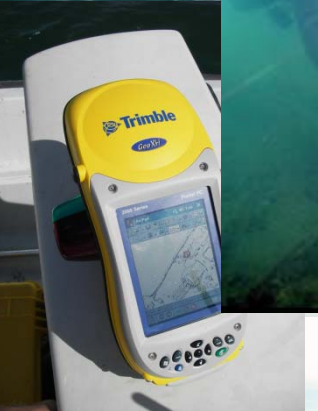


GPS Photo Geotagging with GPS PhotoLink





Topo and High Accuracy Surveying





Topo and High Accuracy Surveying



Missouri National Recreation River Wreck for the *North Alabama*





GPS in the National Park Service

- Very wide variety of users, difficulties, environments
- No official standardization of hardware and software (good or bad?)





Training On-site or Remote

<http://www.ngs.noaa.gov/corbin/>

http://gis.nwcg.gov/training_gps.html

NGS Corbin Training Center



Welcome!

As part of NOAA's National Geodetic Survey's (NGS) mission to provide access to the National Spatial Reference System and to be a leader in geospatial activities, NGS has established a training center in Corbin, VA. The Corbin Training Center (CTC) has a full schedule for this year (see 'Upcoming Classes' link), but requests for class topics are always considered.

The CTC has a classroom which can be configured for various training needs. It is equipped with 15 workstations for computer-based training, or the classroom can be arranged for lectures, discussion, and break-out groups. NGS will be using the CTC to train stakeholders and contractors, but other NOAA/NOS programs are welcome to reserve the facility for training or retreat purposes. Corbin is located near Fredericksburg, VA, approximately an hour and a half south of Silver Spring, MD, and an hour south of Washington, D.C.



Mission

The mission of the Corbin Training Center is to provide high quality training to improve the geodetic positioning capacity of partners internal as well as external to NOAA, and to increase the knowledge and skills of NGS employees. This increased knowledge and capacity will improve the National Spatial Reference System to meet the nation's economic, social and environmental needs.

Contact Us

nos.ngs.corbin.training.center@noaa.gov
Phone: (540) 373-1243
Fax: (540) 373-4327

National Geodetic Survey

- [Corbin Training Center Home](#)
- [Upcoming Classes](#)
- [Past Classes](#)
- [Directions](#)
- [Lodging/Transportation](#)
- [Photos](#)
- [NGS Homepage](#)



**BLUE RIDGE PARKWAY
DESTINATION CENTER**

GPS for Fire Management Class - Ashville, NC
N 35.56572000° W 082.48657000° NAD 83

2008/04/17 11:54:02 AM



Equipment Testing

Post-Processing and Realtime Differential Corrections





Equipment Testing

Data Collection Methodology

- Collect NMEA output from receivers
- Collect about one-half hour of data or 1800 points if possible
- Multiple visits to location if possible

Reasons for Methodology

- Parse data any way you want
- Use in any program
- Higher degree of analysis possible
- Acquire data as close to “raw” as possible
- Supply “raw” data to others

\$GPGGA,183424.000,3941.4159,N,10548.5628,W,1,07,1.2,3006.7,M,-19.8,M,,0000*5A
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\$GPGSV,3,2,11,03,39,065,41,08,34,298,21,06,29,055,40,23,29,155,40*7E
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\$GPGSV,3,1,11,25,69,048,41,13,68,176,41,07,67,339,38,19,46,103,31*7D
\$GPGSV,3,2,11,03,39,065,41,08,34,298,21,06,29,055,40,23,29,155,40*7E
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\$GPGSV,3,2,11,03,39,065,41,08,34,298,28,06,29,055,40,23,29,155,40*77
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Equipment Testing

NMEA Analyzer

File Setup Process Plotting License About

NMEA Log File Summary		Parsed Data Set		Results Summary File	
NMEA Log File Name pt6_mm6_auto_int.csv		Parsed File Name pt6_mm6_auto_int_10pt_Parsed.txt		Summary File Name pt6_mm6_auto_int_10pt_Summary.txt	
Total File Log Lines: 26085		NMEA Sentence: GGA		Archive File Name pt6_mm6_auto_int_10pt_Archive.txt	
NMEA Lines of Interest: 13044		Data Type: Lat-Long		Decimation Sets: 100	
NMEA Sentence Counts		Min GPS Mode: Don't Care		Deviations Formed: 100	
GGA: 3262		Min Satellites: Don't Care		RMS Error: 5.1282 meters	
GLL: 3261		Points Per Mean: 10		Confidence Intervals (meters)	
RMC: 3261		Requested Dec's: 100		99%: 11.0057 3 σ	
GNS: 0		Sampling Mode: Random		95%: 8.8760 2 σ	
Start Time: 6:34:24 PM		Sentences in Parsed File: 3261		68%: 5.7693 1 σ	
End Time: 7:28:45 PM		Rejected: Non-NMEA: 0		50%: 4.2682 CEP	
Time Span (hh:mm:ss): 00:54:21		Rejected: NMEA: 22824		Deviations	
Data Set Description		Filtered Sentences: 0		Index Easting Northing	
Clear		Max Possible Decimations:		0342 -1.1675 -0.0382	
		Random Sampling: 3251		1822 -0.9564 2.9351	
		Seq Sampling - Slide: 3251		2157 -0.0655 0.0986	
		Seq Sampling - Leap: 325		0746 -5.8988 1.6516	
				0863 -3.2546 -4.7002	
				Process	
Horiz Position	NMEA Sentence: GGA	Crit: 6 (WGS84)	Nor Ctrl: 4393696.616	East Ctrl: 430595.423	11:21 AM



Equipment Testing

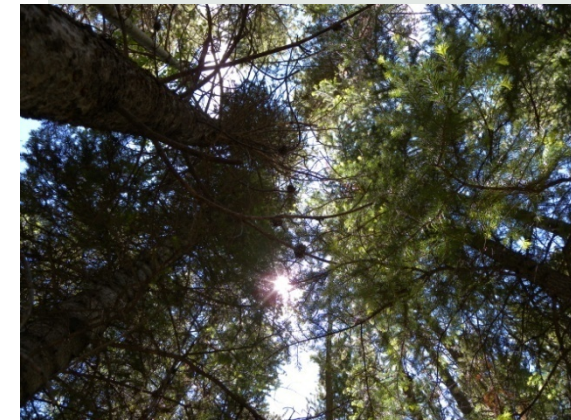
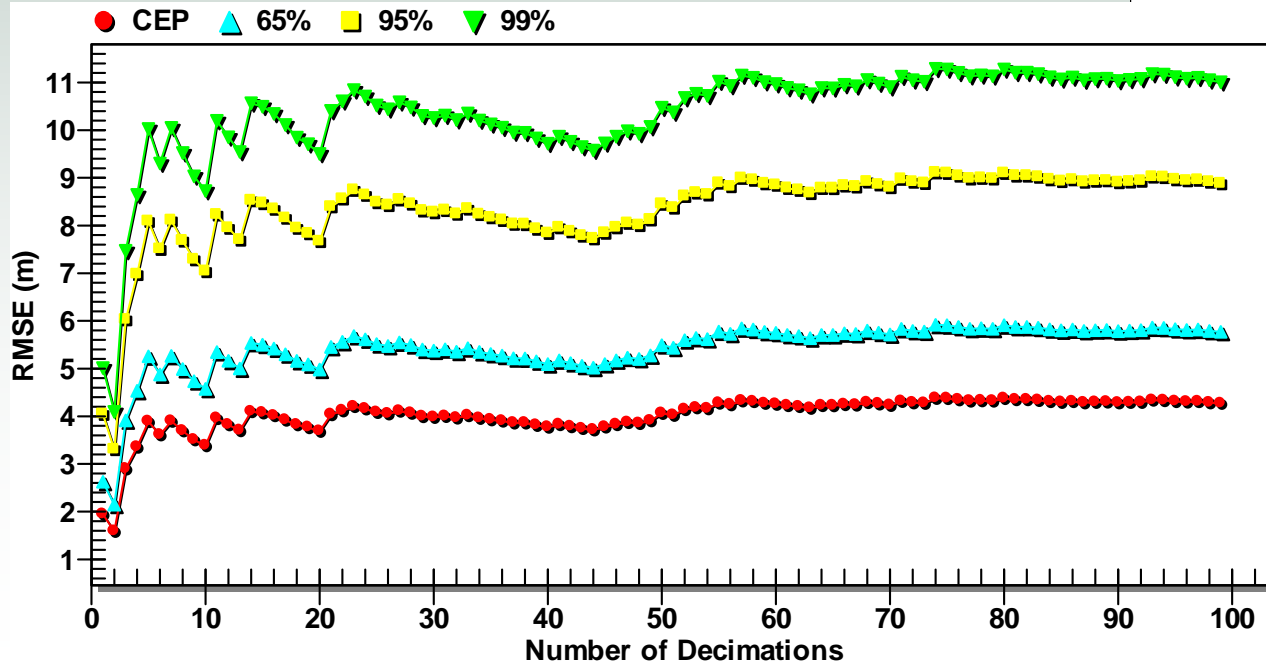
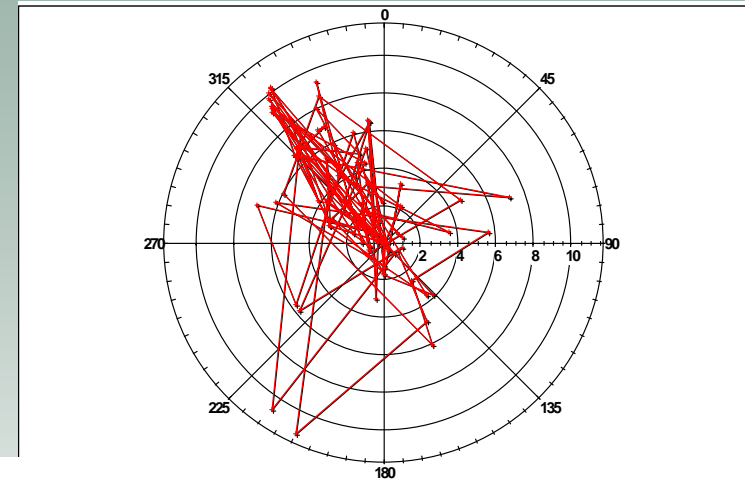
CONFIDENCE INTERVALS

99% Interval: = 11.0057

95% Interval: = 8.8760

68% Interval: = 5.7693

50% Interval: = 4.2682





Equipment Testing

Post-Processing and Realtime Differential Corrections





Equipment Testing

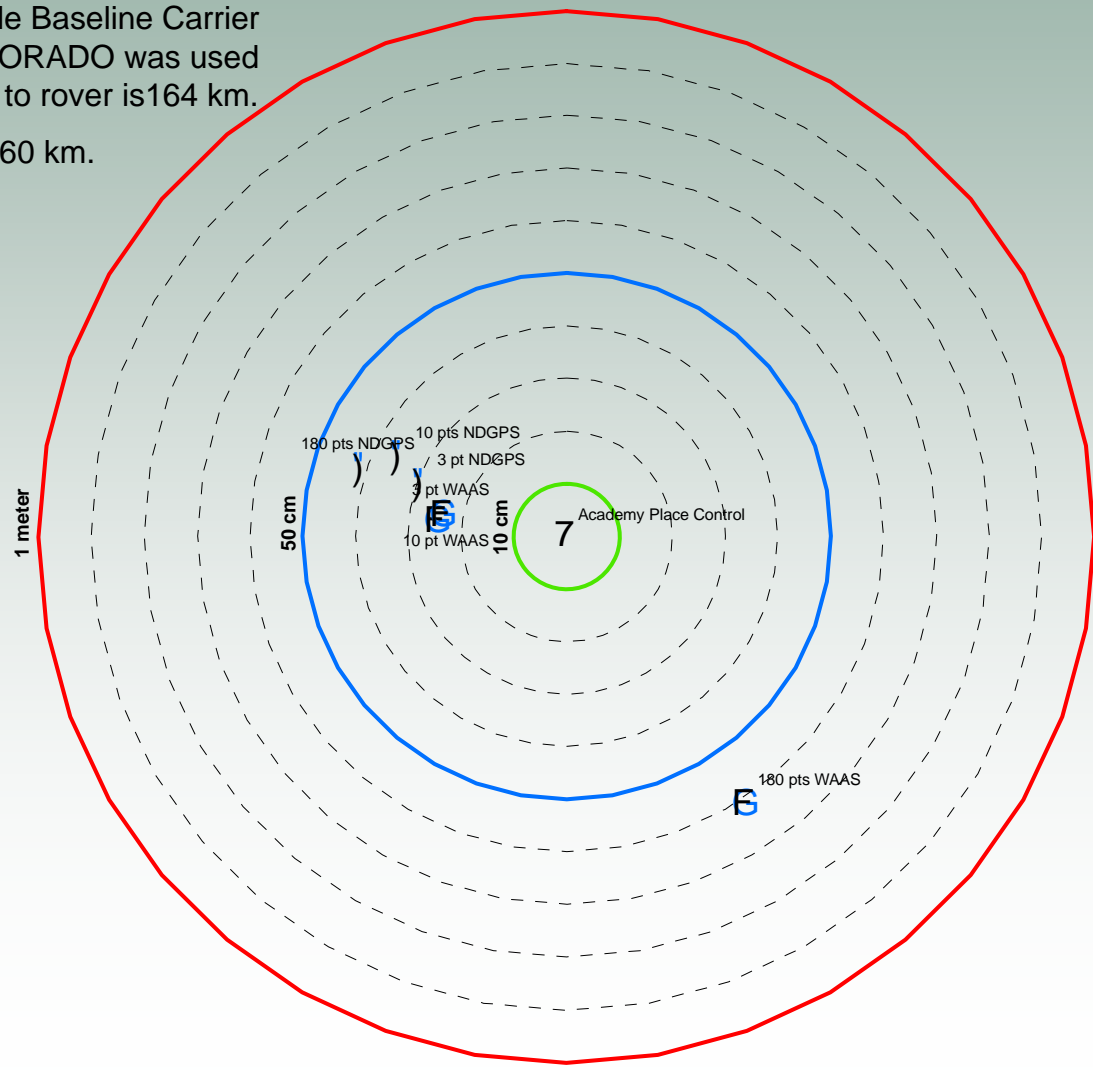
Post-Processing and Realtime Differential Corrections

For Realtime, PP Code and Single Baseline Carrier
 CORS, PUEBLO 5 (PUB5), COLORADO was used
 for the base. Distance from base to rover is 164 km.

Nearest WAAS CORS (ZDV1) is 60 km.

- Legend**
- NDGPS
 - WAAS
 - Realtime (NDGPS and WAAS)
 - Post processed Code
 - Post Processed Single Baseline Carrier
 - Post Processed Multi Baseline Carrier
 - AP Control

- Error Ellipse**
- 10 cm
 - 30 cm
 - 40 cm
 - 50 cm
 - 60 cm
 - 70 cm
 - 80 cm
 - 90 cm
 - 1 m





Equipment Testing

Post-Processing and Realtime Differential Corrections

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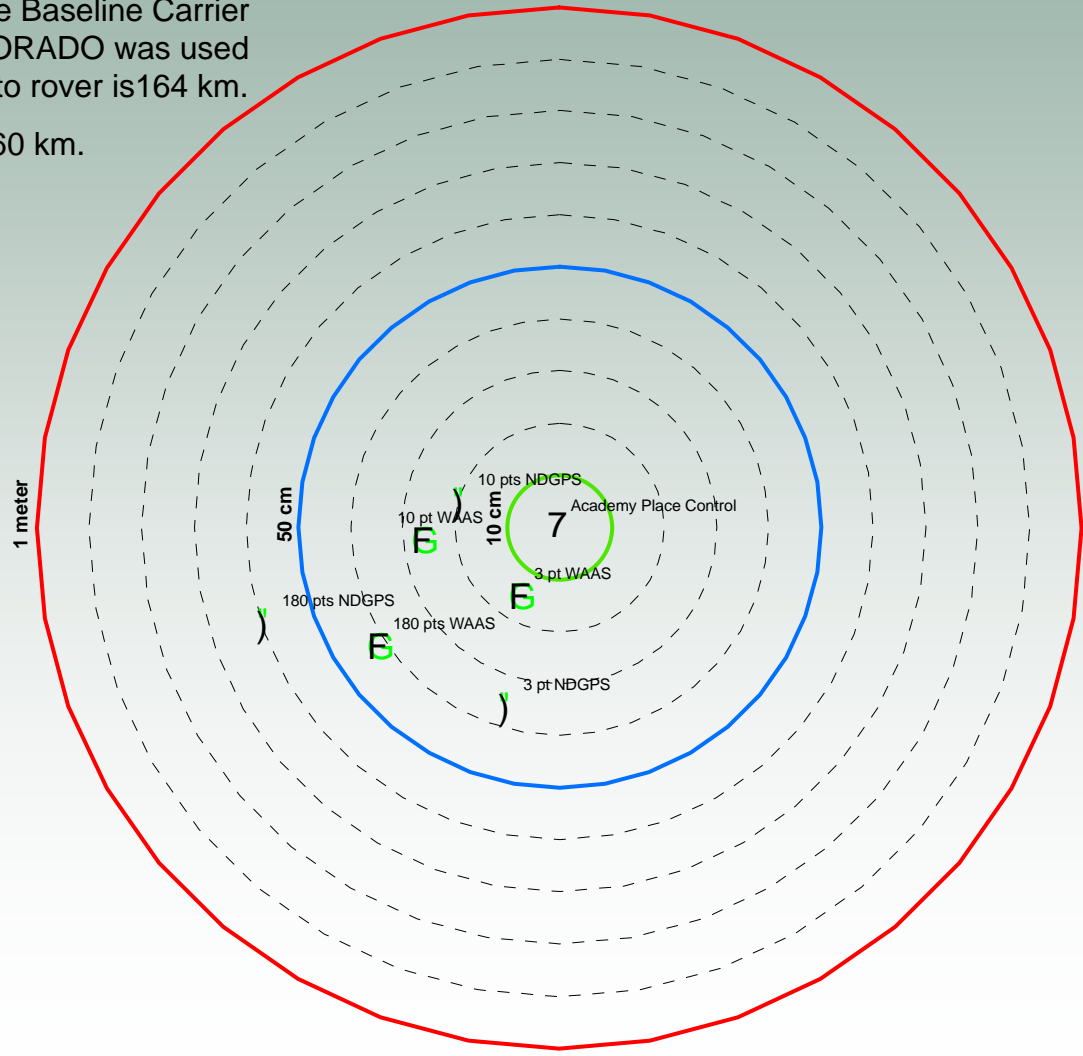
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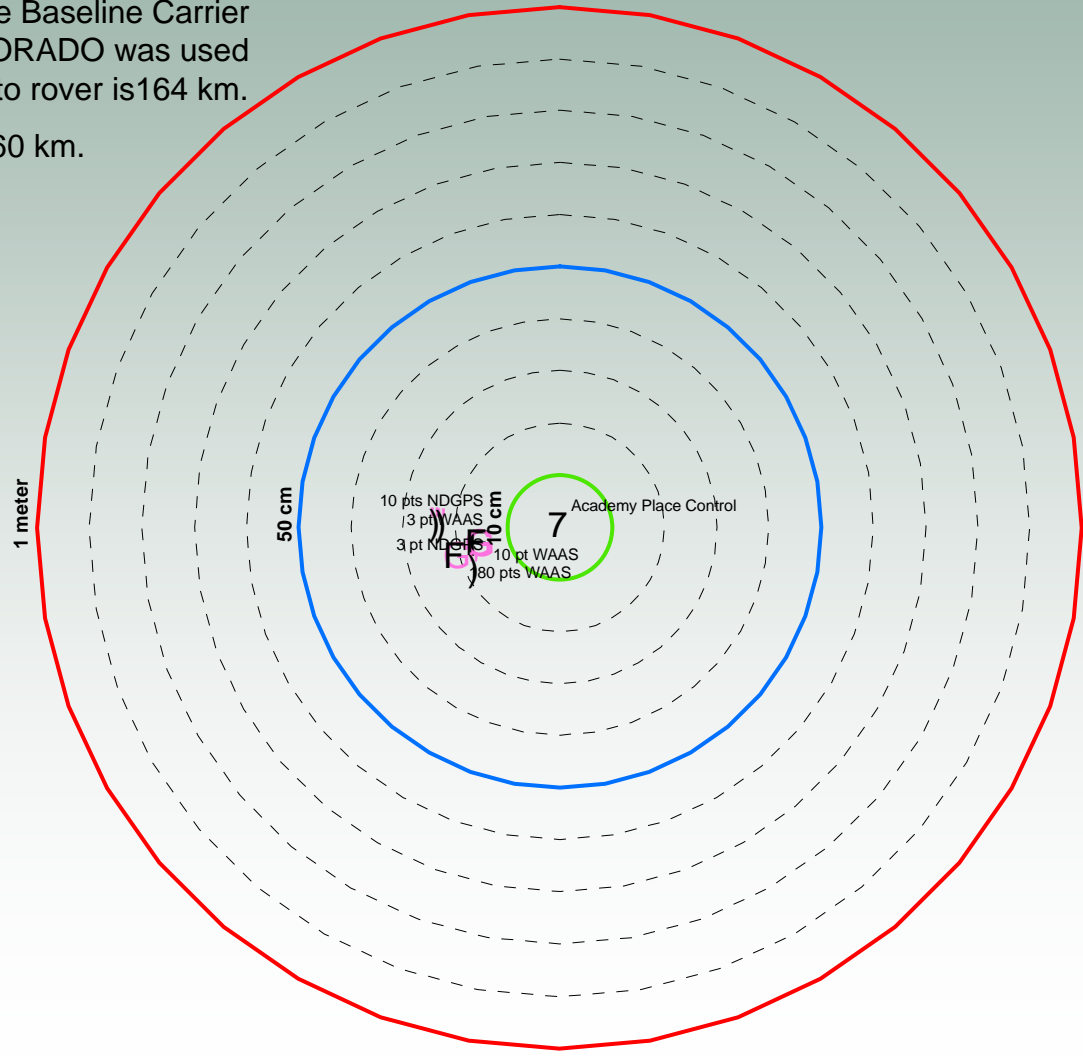
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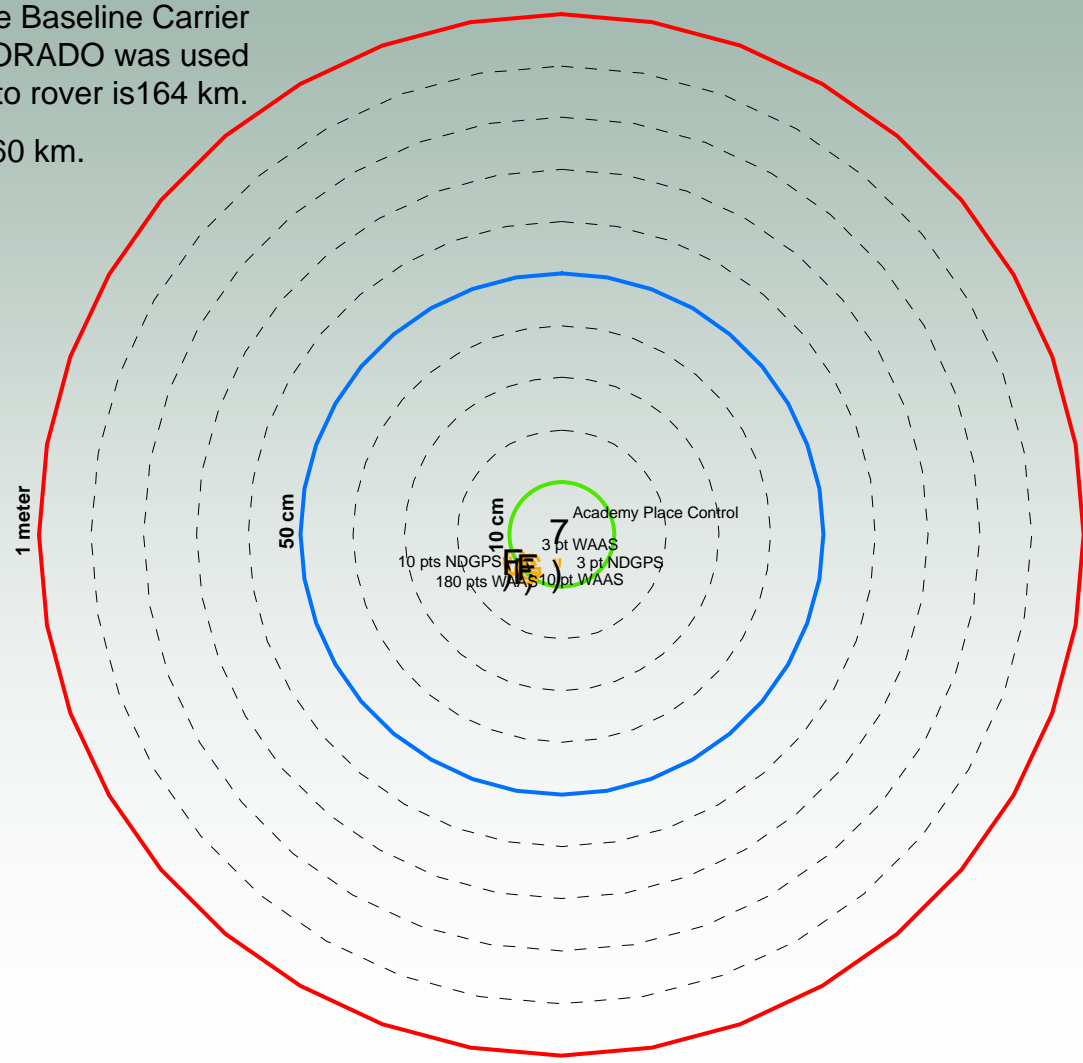
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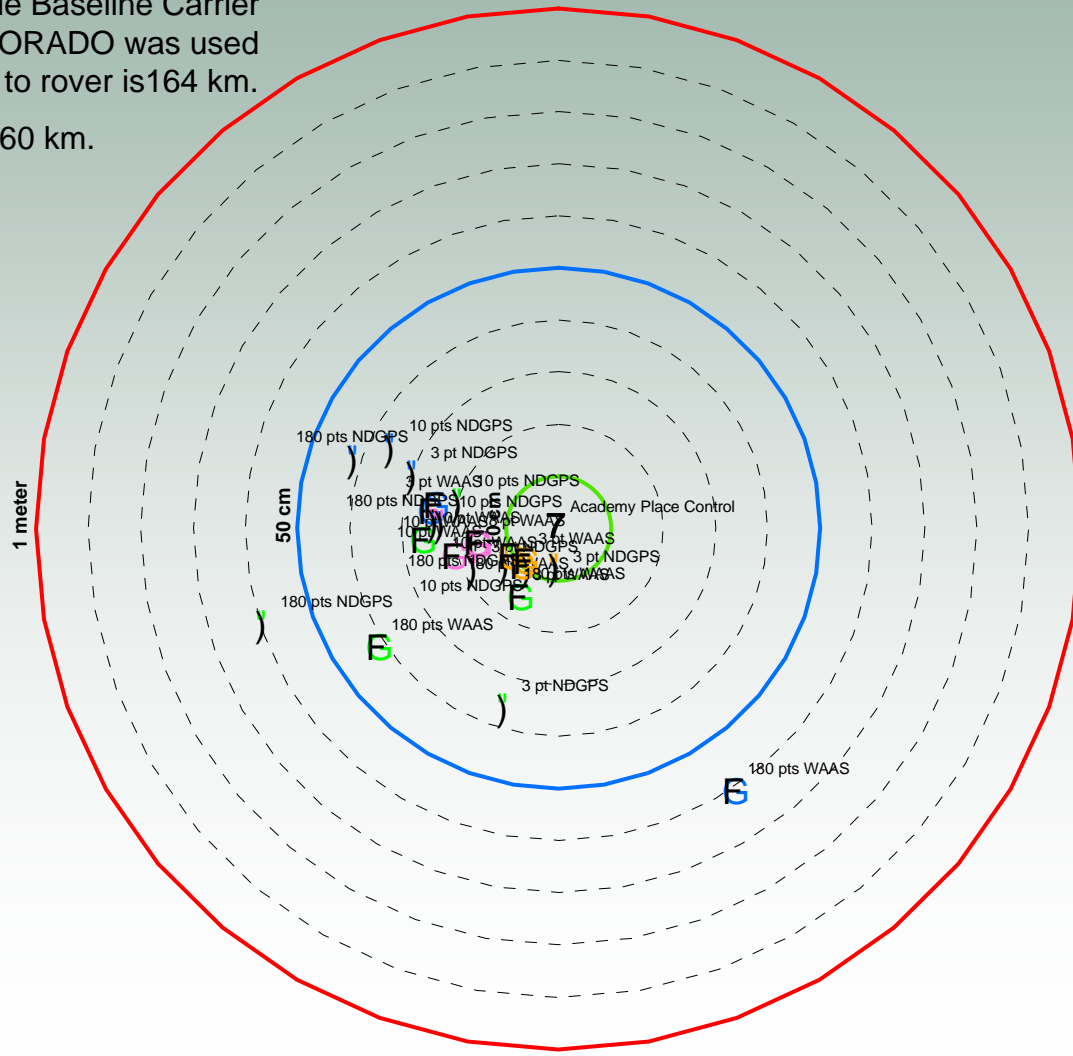
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High Accuracy Equipment Testing in 2010

HA-NDGPS and RTN

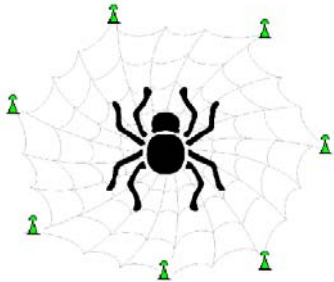
Leica

Trimble

HA-NDGPS at Pueblo, CO



Hixon Mfg. & Supply Co.
CO, WY GPS Spider-Net
Reference Network



Hixon Mfg & Supply Co.
1001 Smithfield Dr.
Ft. Collins, CO 80524
970.482.0111 phone

8745 E. Orchard Rd
Englewood, CO 80111
303.694.0012 phone

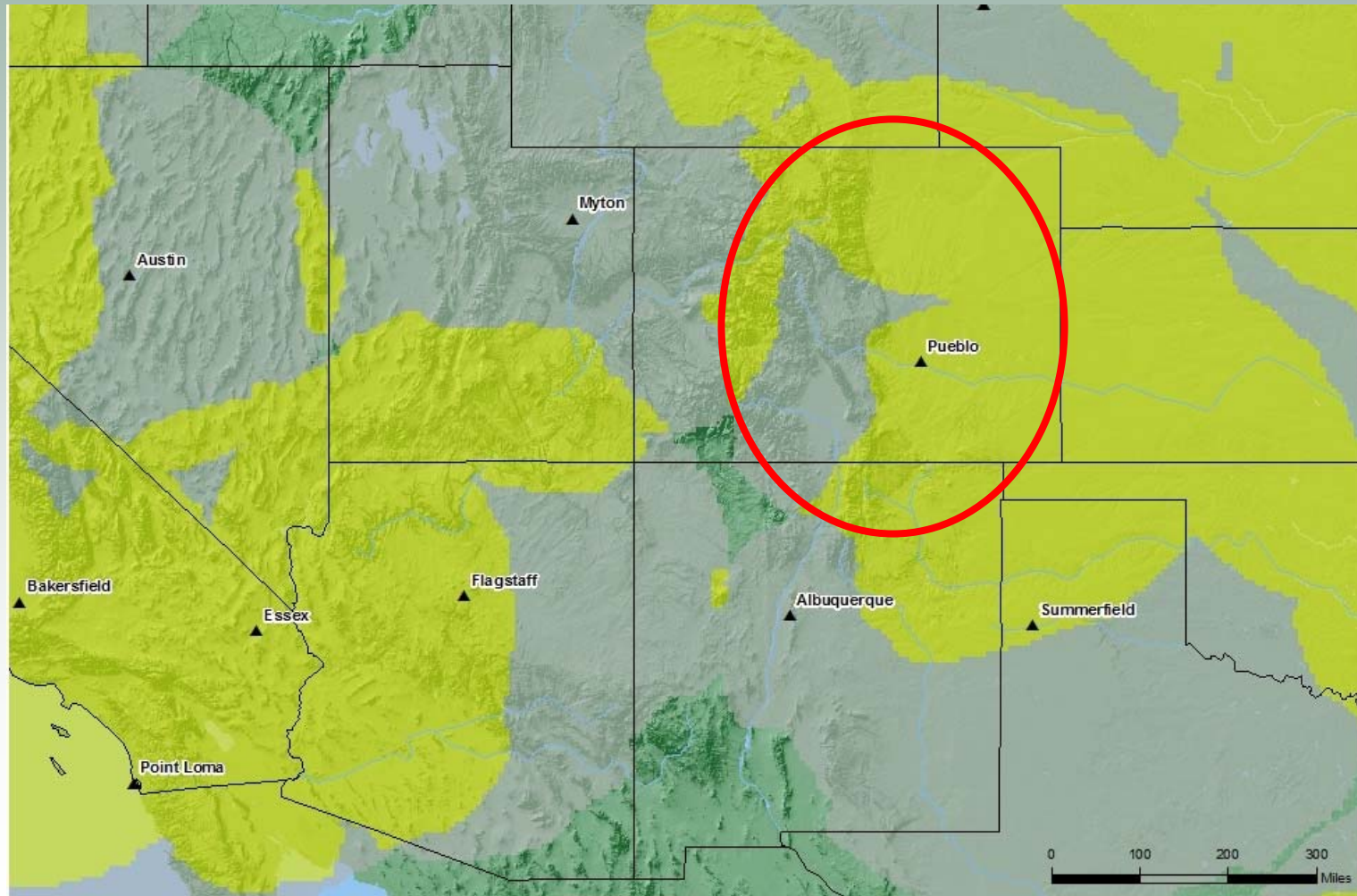
www.hixonmfg.com





High Accuracy Equipment Testing in 2010

HA-NDGPS and RTN





Contact Information:

Tim Smith, National GPS Program Coordinator

RISC-NISC-OCIO

National Park Service

Tim_Smith@nps.gov

(303) 969- 2086

