



11103U Dewberry VA FEMA USGS

Area 1 - Worcester, MD

Acquisition Summary

Craig Sheriff

2011 03 30



11103U Area 1 – Worcester, MD - Flightline Overview Map

System Information

System 1 – Optech 3100EA		
Item	Parameter	units
System ID(s)	o1	o1,o2 etc...
Aircraft Type	Navajo	
Call sign	1009S	
Endurance	6	hours
Aircraft Speed	150	knots
Data Acquisition Height	950	m AGL
Swath Width	691.54	m
Distance Between Flight Lines	311.2	m
Overlap	55%	%
Scanner Field Of View	22	+/- degrees
Pulse Repetition Rate	70	KHz
Scan Frequency	40	Hz
Number of Returns Per Pulse	4	waveform / 4 for Optech / 1 low range
Beam Divergence	Narrow	mRad or Narrow for Optech
Flight Line Length	70	<X km
Base Station Distance	~30km	<X km
Resultant Raw Point Density	2 point	pt/m2 with overlap

Mission Summary

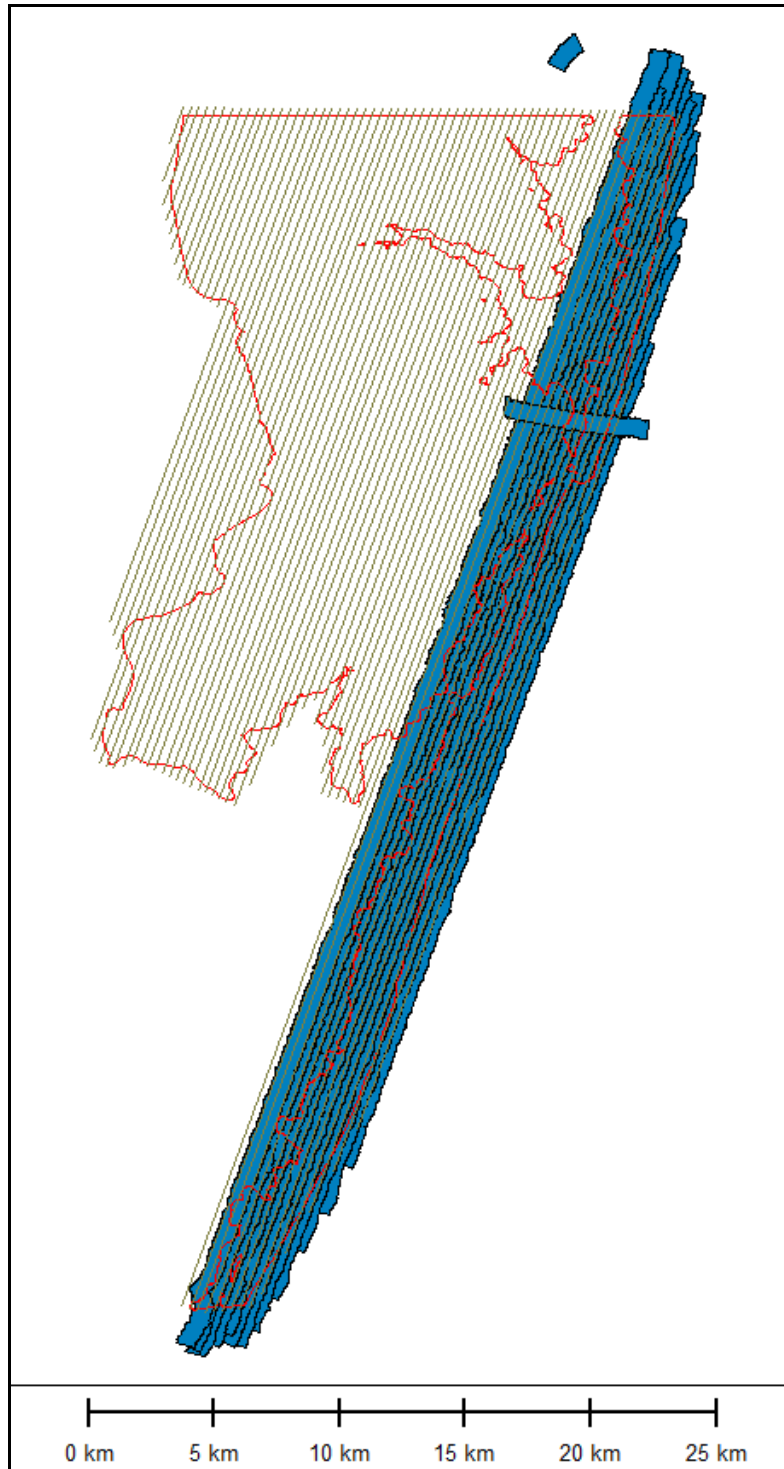
Survey Block	Base Station 1	Mission Name	Calendar Date	Number of LiDAR Production Lines	LiDAR Hours	Temperature and Pressure	Notes
Worcester	1110312	o111084a	25-Mar	12	4.2	7/8 3004/2996	Lines 56-67
Worcester	1110312	o111084b	25-Mar	14	4.1	8/7 2994/2998	Lines 42-55
Worcester	1110312	o111085a	26-Mar	14	3.1	6/6 3007/3004	Lines 29-42
Worcester	1110312	o111087a	28-Mar	24	4.4	8/10 3004/3001	Lines 5-28
Worcester	1110312	o111088a	29-Mar	4	1.8	8 3020	Lines 1-4

Control Summary

Survey Block	Station	Latitude (D M S Hem)	Longitude (D M S Hem)	Easting (m)	Northing (m)	H-Ell (m)	H-MSL (m)
Worcester	1110312	N38 18 22.12367	W75 07 40.46389	488816.982	4239791.120	-33.792	2.258

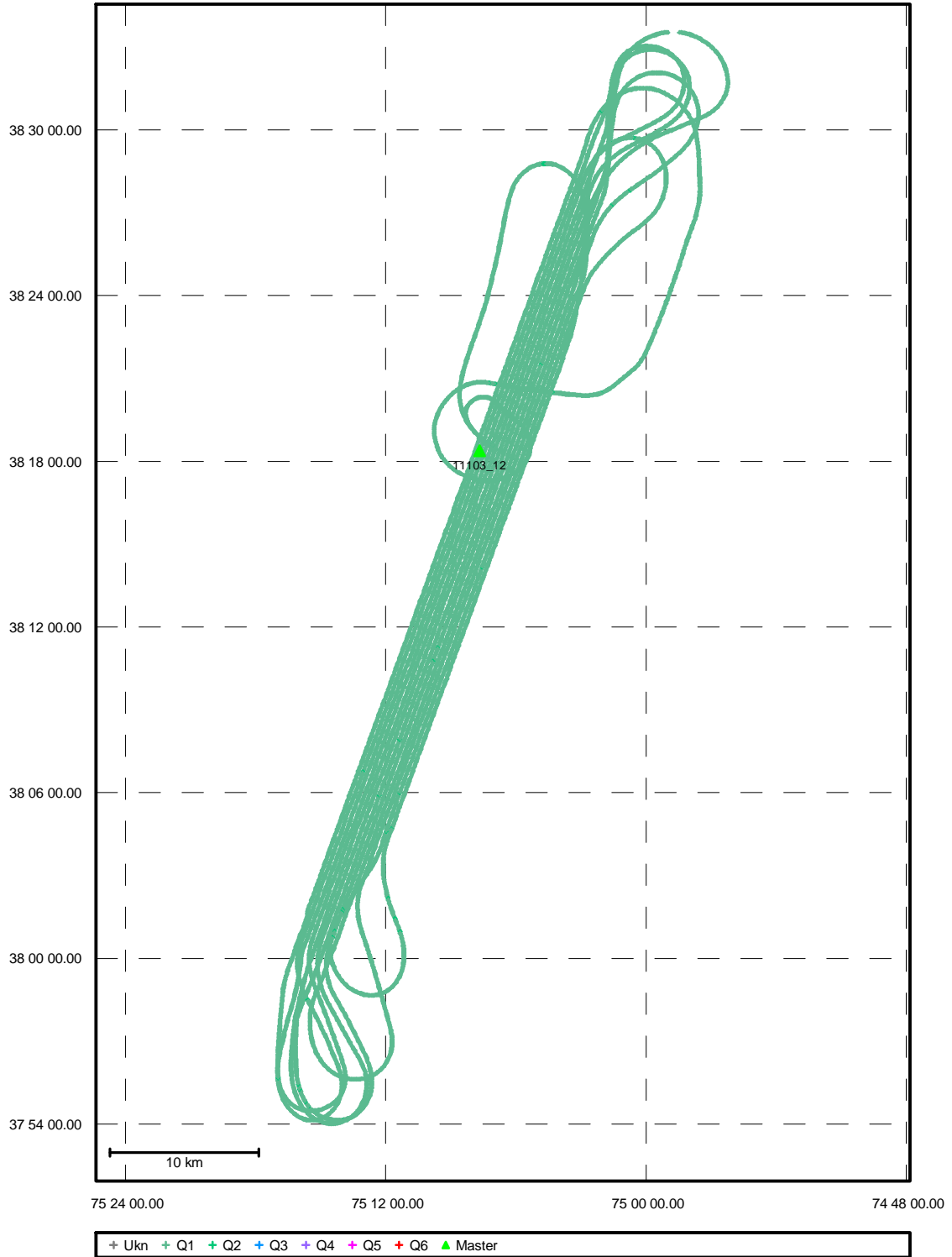
Mission: o111084a

2011 03 25



Combined - Map Run (5)

Geographic, DMS



Processing Summary Information

Program: GrafNav
Version: 7.80.2517
Project: C:\Documents and Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084a\3_Processed\GPS\o111084a.cfg

Solution Type: Combined Fwd/Rev

Number of Epochs:
Total in GPB file: 148819
No processed position: 134152
Missing Fwd or Rev: 4
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0164 (m)
C/A Code: 0.78 (m)
L1 Doppler: 0.032 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.024 (m)
North: 0.014 (m)
Height: 0.019 (m)

Fwd/Rev Sep. RMS for 25%-75% weighting (14658 occurrences):
East: 0.024 (m)
North: 0.014 (m)
Height: 0.018 (m)

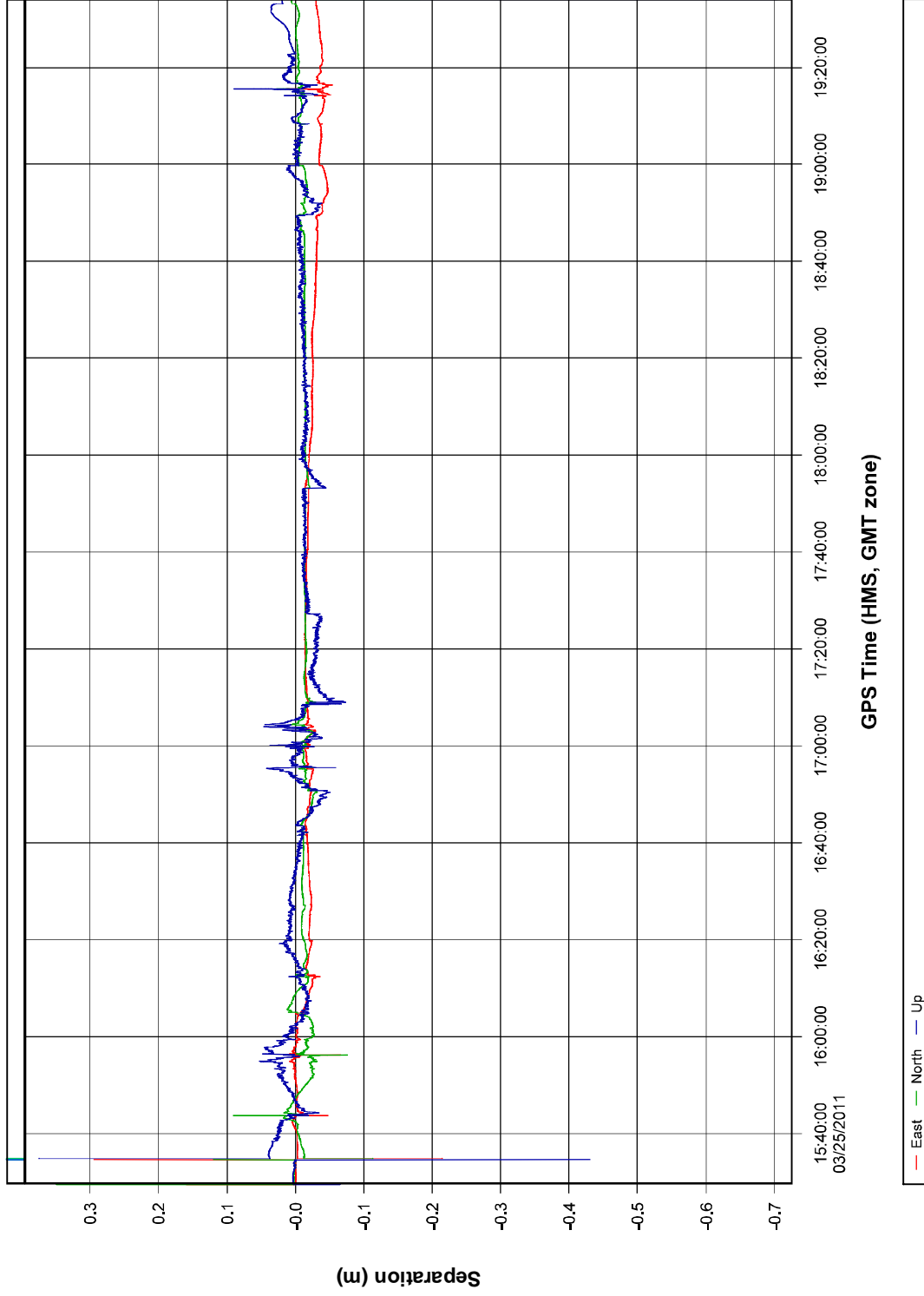
Quality Number Percentages:
Q 1: 99.7 %
Q 2: 0.3 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:
0.00 - 0.10 m: 99.6 %
0.10 - 0.30 m: 0.4 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

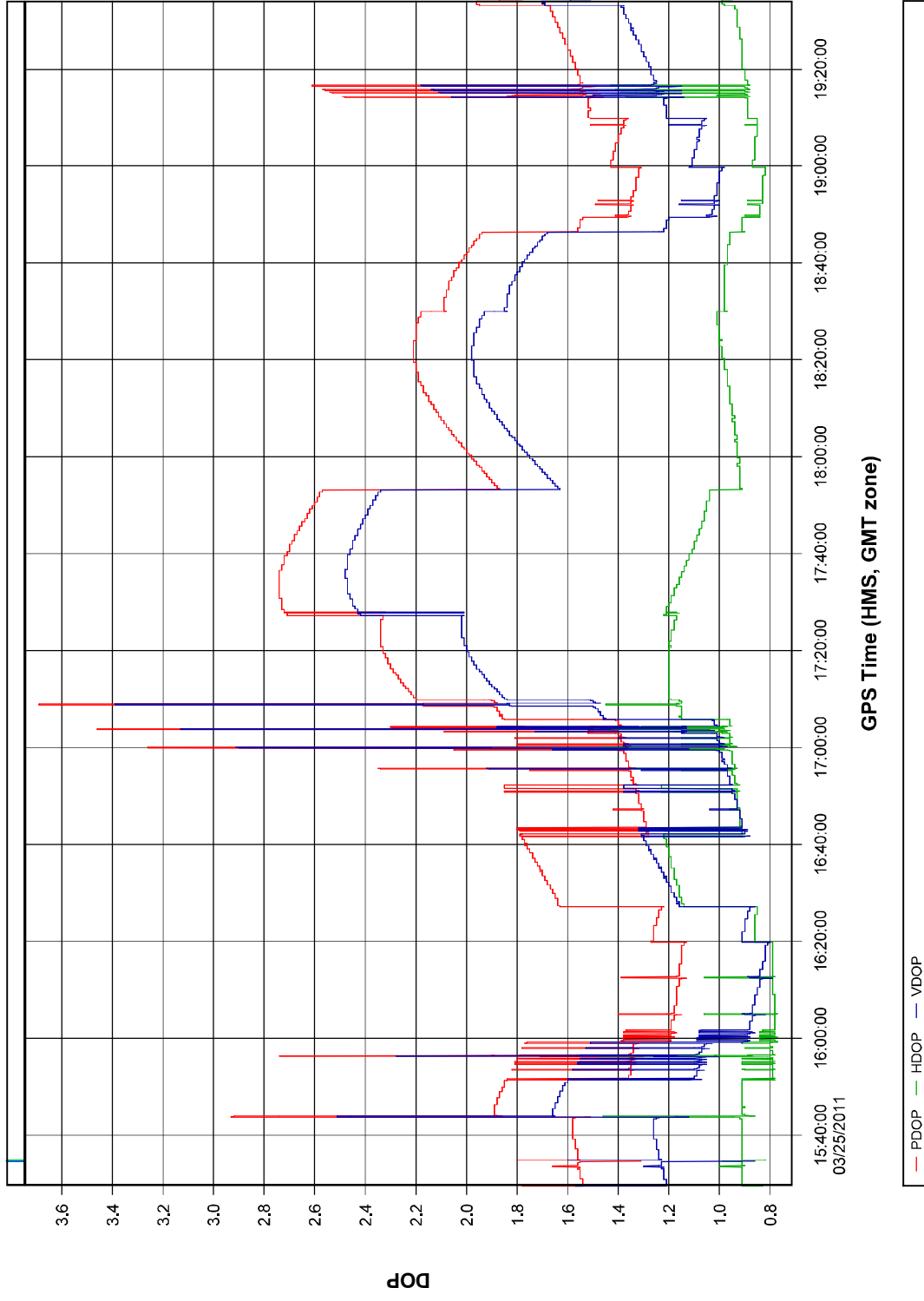
Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.1 %

Baseline Distances:
Maximum: 46.314 (km)
Minimum: 0.694 (km)
Average: 17.805 (km)
First Epoch: 0.935 (km)
Last Epoch: 0.978 (km)

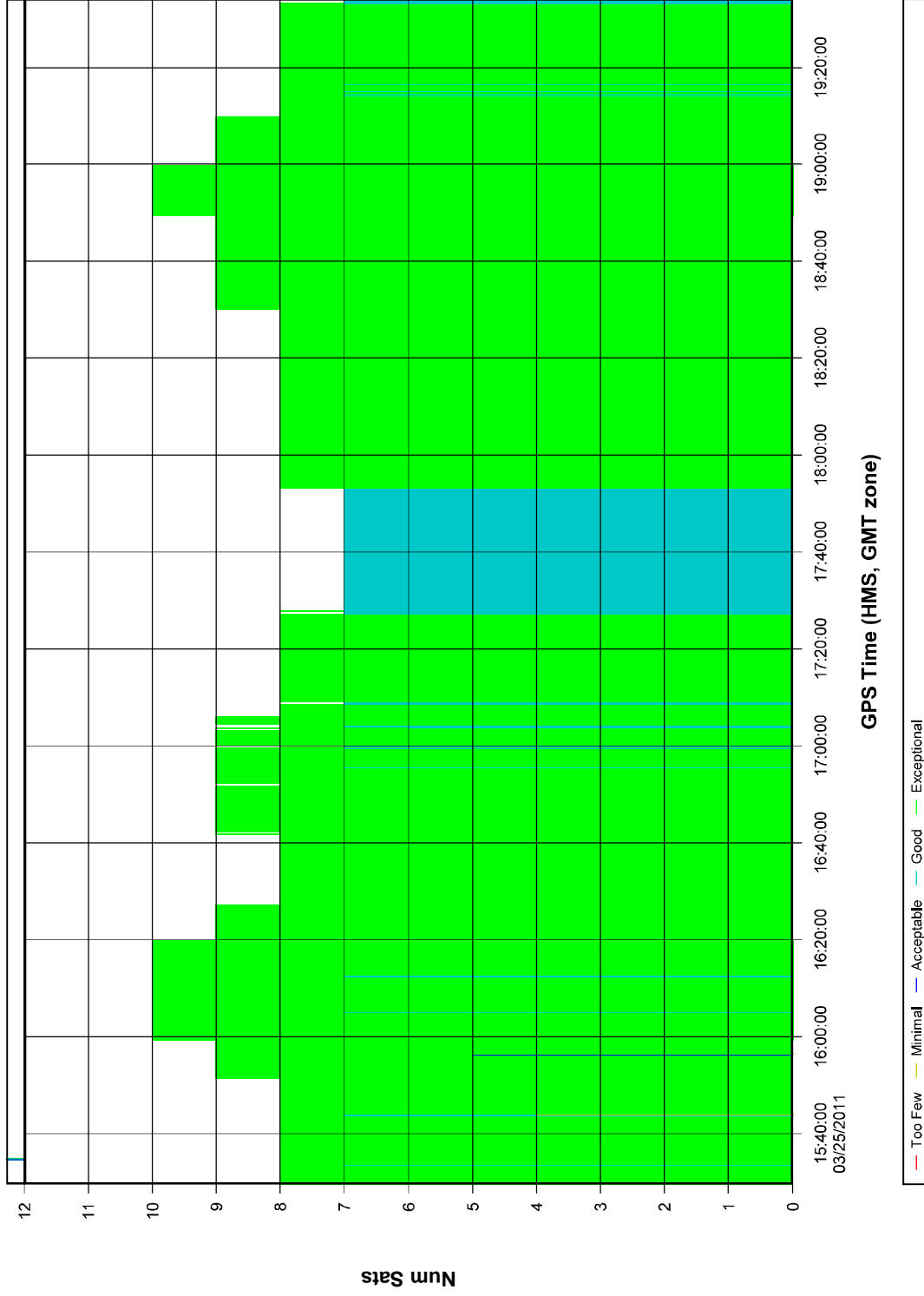
o111084a [Combined] - Forward/Reverse or Combined Separation Plot



o111084a [Combined] - PDOP, HDOP, VDOP Plots



o111084a [Combined] - Number of Satellites Bar Plot





Flight Log

Project # 11103u Session 2111081A

Date	Mar 25 / 11	Julian Day	084
Project	Frank Virginia	Aircraft	Navajo
Staging	Woburnsky	Call Sign	10095
Survey Block	56-67	Pilot	Race Baker
Lines Complete		Operator	Matthew
Mission Objective		Observer	NA

ALMIS/Optech	0
System #	1
Laser Scanner	
Camera/Lens SN	NA
Shutter Speed	NA
Photo Freq.	NA
IMU	
GPS Fix	
Data Drive	

Additional Notes:

Outside Temp @ TO: 7 Outside Pressure @ TO: 35.04
 Outside Temp @ LA: 8 Outside Pressure @ LA: 29.96

Aircraft Block Time	<input type="checkbox"/> Times confirmed with pilot	
Engine On (Hobbs)	Ramp Out	Taxiout
118		11:38
Engine Off (Hobbs)	Ramp In	Landing
3:35		3:23
Total hrs (Hobbs)	Total hrs	Total hrs
4.0		3.75

Mission Plan	
Flying Height AGL	Scan Angle (Dip/ech)
950 M	
Ground Speed	Minor Scan Rate
150 kts.	
First/Last/Alternating Return	Laser Pulse Rate

Static & KAR GPS // INS Alignment		
Time	Start	End
Pre Mission	11:18	11:26
KAR Base	11:26	11:36
KAR Base	3:24	3:34
Post Mission	3:24	3:35

Flight Plan Line #	LIDAR File Name	Flight Direction	GPS / UTC Time		Flight Aborted		Photo Events / Comments		
			Start	End	Time	NM to End	Outside Temp	Cabin Temp	Laser Temp
67		S	11:48	11:55					
66		N	12:00	12:09					
65		S	12:15	12:24					
64		N	12:31	12:42					
63		S	12:48	1:00					
62		N	1:06	1:16					
61		S	1:25	1:37					
60		N	1:43	1:55					
59		S	2:01	2:13					
58		N	2:19	2:31					

GPS Base Log Sheet



Station ID:	Base 12	Project #:	111034	Missions:	d11084
-------------	---------	------------	--------	-----------	--------

Project Name:	FEMA Virginia	Calendar Date:	Mar 25/11	Julian Day	084
Approx. Coordinates	WGS 84	N	381822.12	W	750740.45
Description of Mark (Take Photos)					
Monument is:	<input type="checkbox"/> Flush with ground	<input checked="" type="checkbox"/> Above ground	2.5	cm	<input type="checkbox"/> Below ground _____ cm
Location & Access					

Observations & Additional Notes
Backup: Approx. Coordinates: WGS 84
N
W

GPS Observation - MAIN

Rx Make / Model	GSR 2600	Serial #	0020
Ant Make / Model	SK 600	Serial #	0010
Operator	Matt W		
Session Time (GPS)	Start	End	
	14:56	1:46	
Slant HI Before:	A: 1.492	B: 1.492	
Slant HI After:	A: 1.492	B: 1.492	
Correction			
Phase Center			
Data File Name	00200840.pdc		

GPS Observation - Back-Up

Rx Make / Model		Serial #	
Ant Make / Model		Serial #	
Operator			
Session Time (GPS)	Start	End	
Slant HI Before:	A:	B:	
Slant HI After:	A:	B:	
Correction			
Phase Center			
Data File Name			

```

                                o111084a.cfg
; PROJECT:      C:\Documents and
Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084a\3_Processed\GPS\o111084a.cfg
;
; DATE:        March 28/11 (date/time of processing)
; TIME:        21:18:51
; CREATED BY:  GrafNav Version 7.80.2517
;
VERSION = 7.80.2517
PROCUSER = Unknown
PRODESC = Run*(7)
PROCTIME = 21:14:48 03/28/2011

; Master station # 1 information
MB_MASTER_INDEX = 0
MB_MASTER_NAME = 1110312
MB_MASTER_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084a\1_RawData\original_PDC_files\Base12_0020_0840.gpb
MB_MASTER_POS = 38 18 22.12367 -75 07 40.46389 -33.7920
MB_MASTER_ANT = 1.526 0.001 1.492 1 _TP_SOK600 0
MB_MASTER_DISABLE = OFF

; Remote station information
REMOTE_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084a\3_Processed\Extract\mgps_o111084a.gpb
REMOTE_POS = 38 18 34.72854 -75 07 05.48330 -29.3929
REMOTE_ANT = 0.000

; General settings
PROCESS_MODE = 105 108 113 126 ; Processing modes (GrafNav only)

DATUM = NAD83 AUTO ; Processing Datum
INPDATUM = ON NAD83 AUTO ; Input Datum (ON=Use processing datum)
ELEV_MASK = 9.0 ; Elevation mask (deg)
GRID = UTM 15 31 ; Grid info

CYCLE_TEST = BOTH ; Cycle slip test method
STATIC_SLIP_TOL = 0.40 ; slip tolerance in static mode (cycles)
USE_DOPPLER = ON OFF ; Use doppler meas. for phase, for code-only

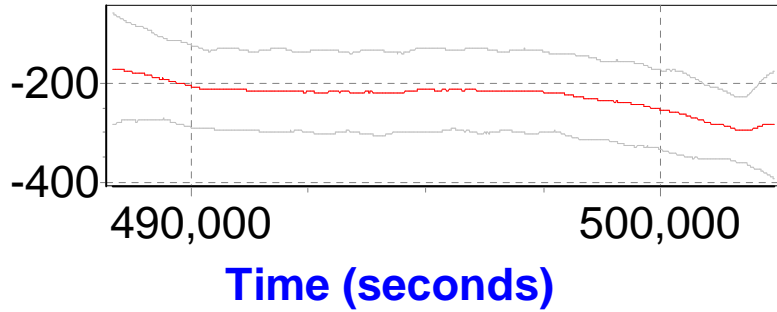
BASE_SAT = 99 ; Base satellite (99-default)

TIMERANGE = RANGE 985102169.0 985116847.8 2 0 ; Processing time range
INTERVAL = 0.10 ; Processing time interval (seconds)

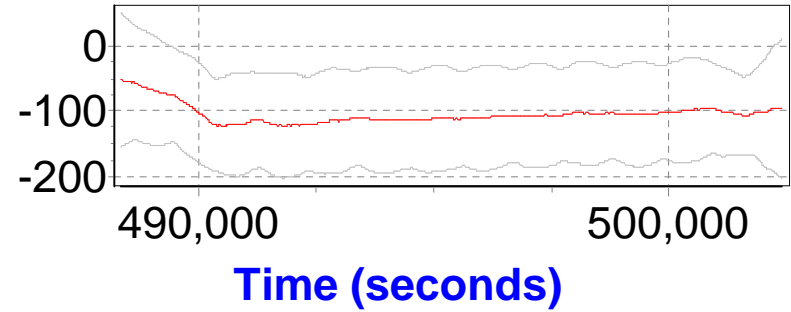
PROCESS_DIR = FORWARD ; Process direction (FORWARD/REVERSE)
BOTH_DIR = ON ; True for processing both directions
WRITE_BAD_EPOCHS = OFF ; Save bad data to .fwd/rev file (ON/OFF)
NOWRITE_HIGH = OFF 6 20.000 ; Don't write epoch with high statistics (q, stdev-m)
OUTPUT_MODE = EXTENDED ; Format for .fwd/rev file
DETAILED_SUM = ON ; Detailed Static/KAR Summary header
WRITE_SLIP_MSG = ON ; Print cycle slips to message log
SAVE_AMB = ON ; Should ambiguities be saved

```

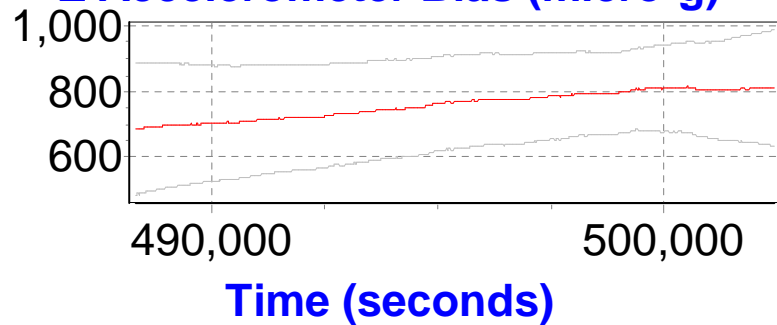
X Accelerometer Bias (micro-g)



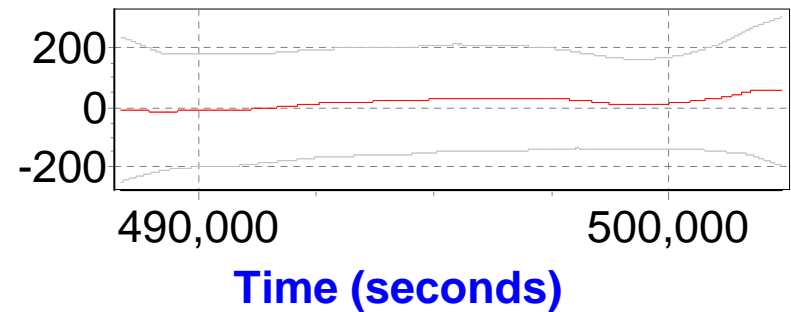
Y Accelerometer Bias (micro-g)



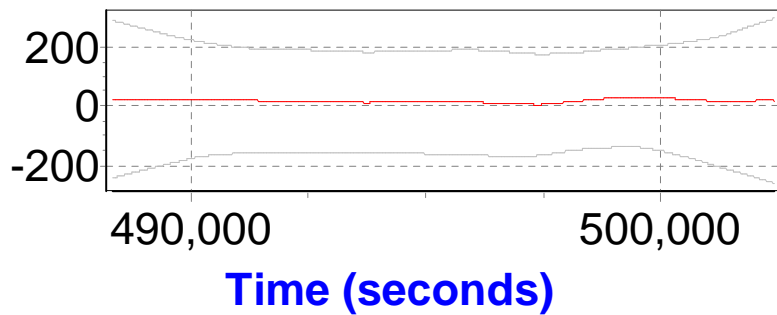
Z Accelerometer Bias (micro-g)



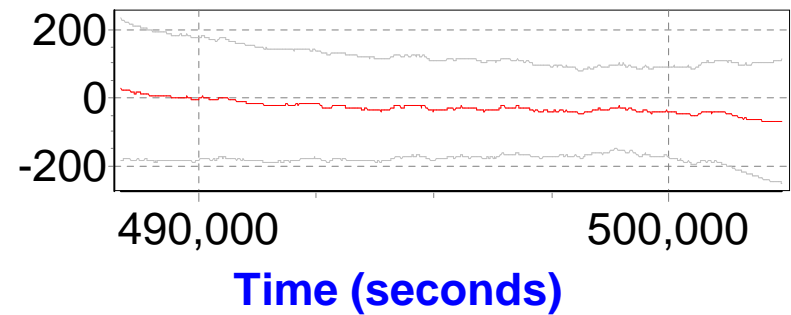
Accelerometer Scale Factor Error (ppr)



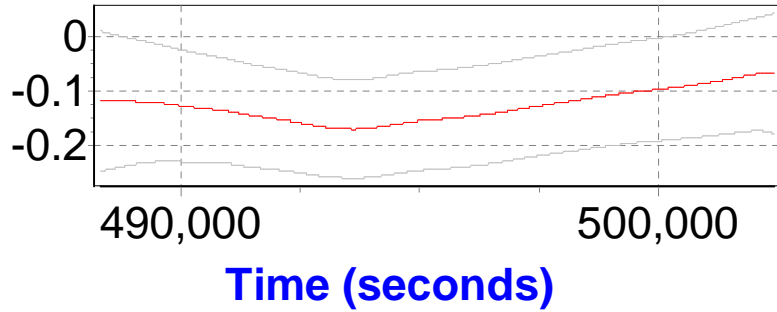
Accelerometer Scale Factor Error (ppr)



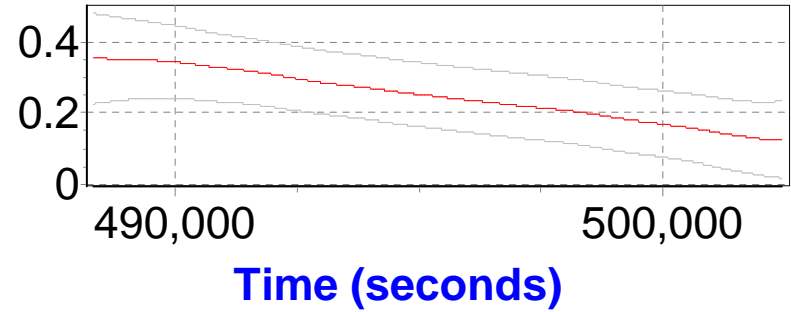
Accelerometer Scale Factor Error (ppr)



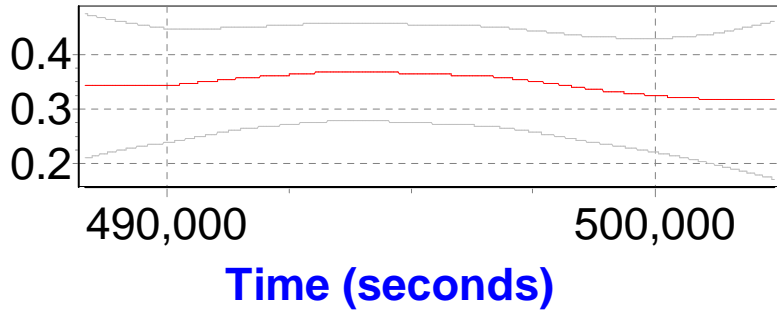
X Gyro Bias (degrees/hour)



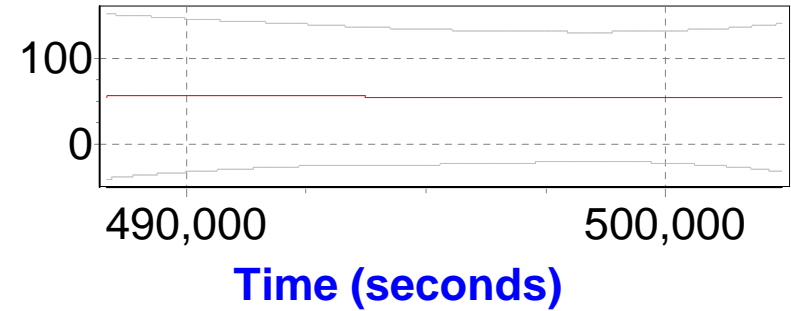
Y Gyro Bias (degrees/hour)



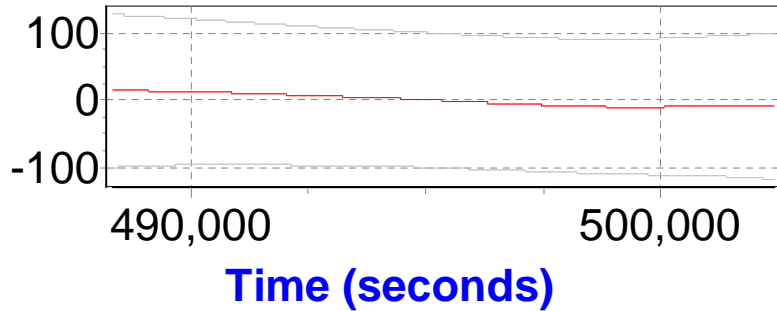
Z Gyro Bias (degrees/hour)



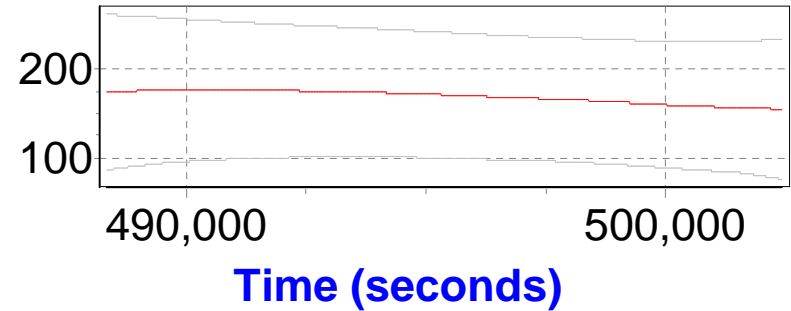
X Gyro Scale Factor Error (ppm)



Y Gyro Scale Factor Error (ppm)

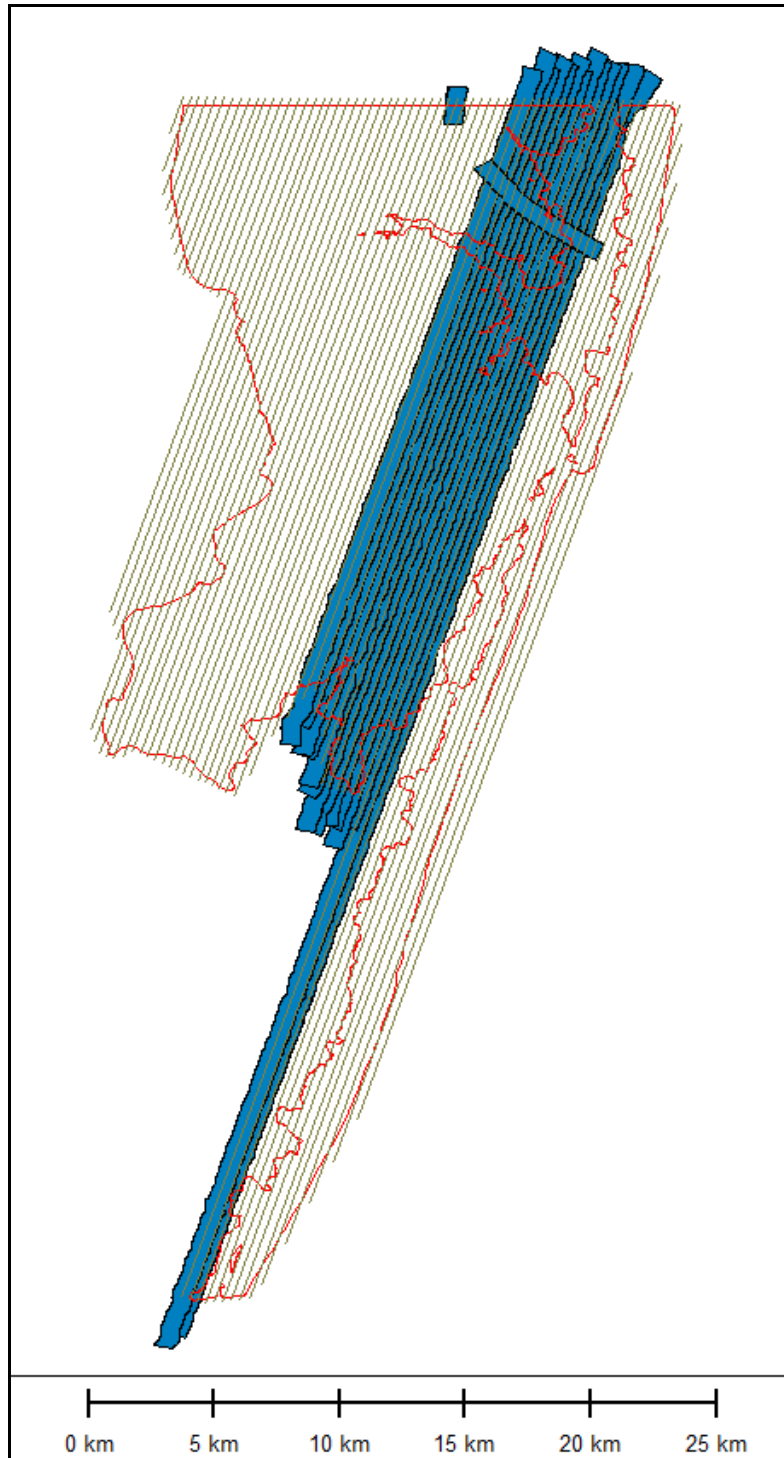


Z Gyro Scale Factor Error (ppm)



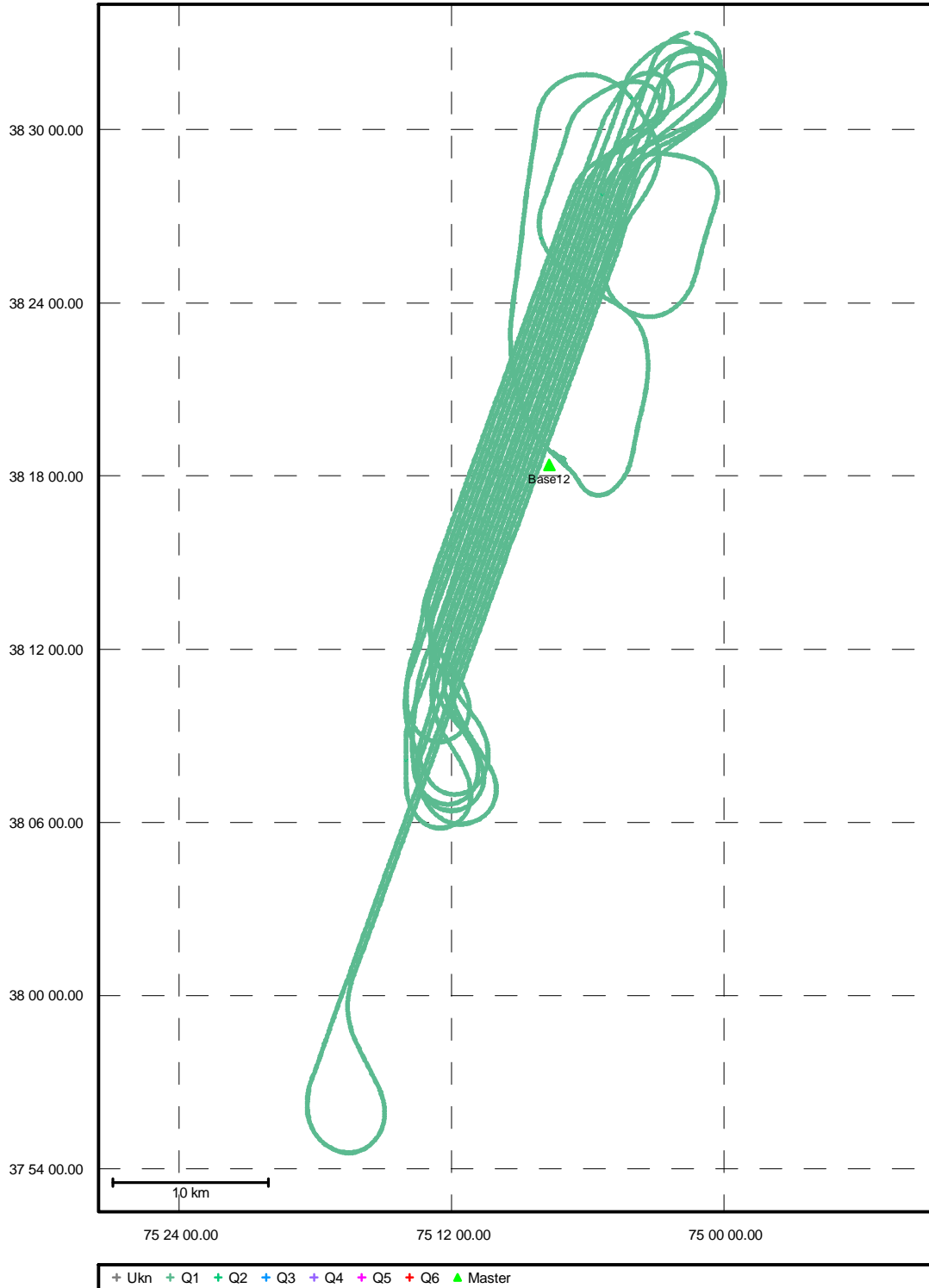
Mission: o111084b

2011 03 25



Combined - Map Run (3)

Geographic, DMS



Processing Summary Information

Program: GrafNav
Version: 7.80.2517
Project: C:\Documents and Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084b\3_Processed\GPS\o111084b.cfg

Solution Type: Combined Fwd/Rev

Number of Epochs:
Total in GPB file: 140248
No processed position: 126433
Missing Fwd or Rev: 1273
With bad C/A code: 0
With bad L1 Phase: 0

Measurement RMS Values:
L1 Phase: 0.0165 (m)
C/A Code: 0.72 (m)
L1 Doppler: 0.031 (m/s)

Fwd/Rev Separation RMS Values:
East: 0.004 (m)
North: 0.009 (m)
Height: 0.029 (m)

Fwd/Rev Sep. RMS for 25%-75% weighting (12530 occurrences):
East: 0.004 (m)
North: 0.008 (m)
Height: 0.024 (m)

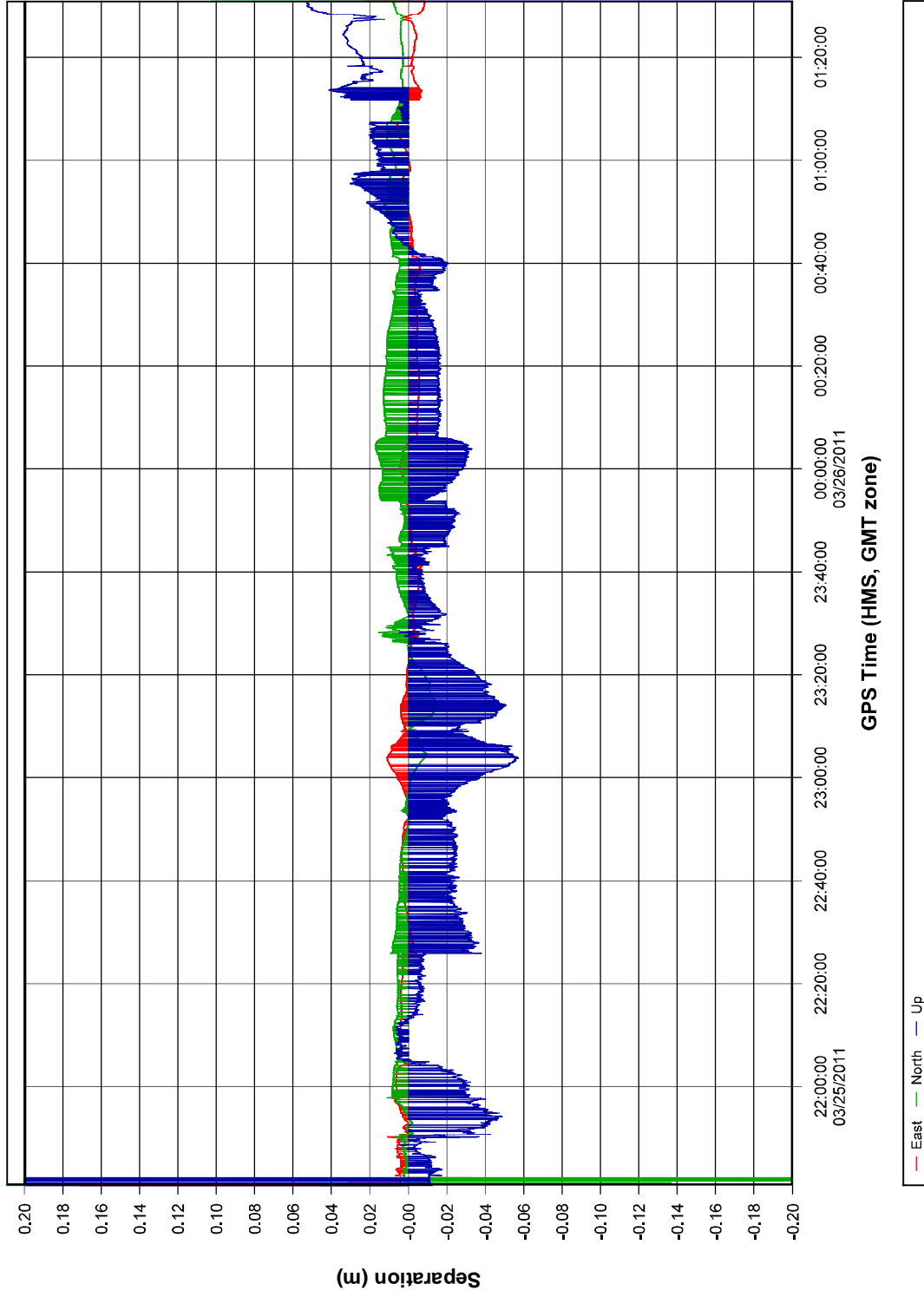
Quality Number Percentages:
Q 1: 99.9 %
Q 2: 0.1 %
Q 3: 0.0 %
Q 4: 0.0 %
Q 5: 0.0 %
Q 6: 0.0 %

Position Standard Deviation Percentages:
0.00 - 0.10 m: 100.0 %
0.10 - 0.30 m: 0.0 %
0.30 - 1.00 m: 0.0 %
1.00 - 5.00 m: 0.0 %
5.00 m + over: 0.0 %

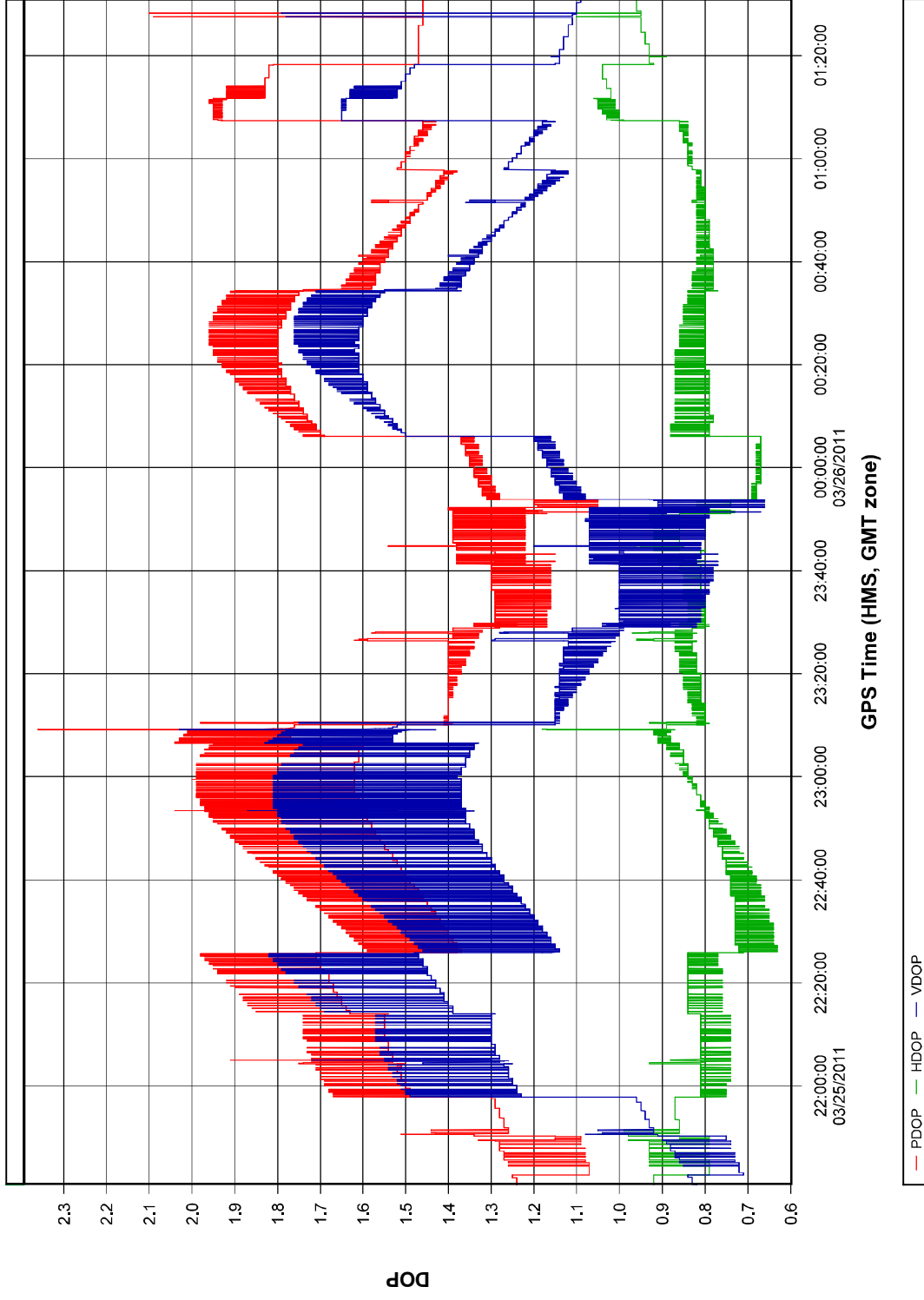
Percentages of epochs with DD_DOP over 10.00:
DOP over Tol: 0.0 %

Baseline Distances:
Maximum: 46.024 (km)
Minimum: 0.691 (km)
Average: 13.711 (km)
First Epoch: 0.954 (km)
Last Epoch: 0.978 (km)

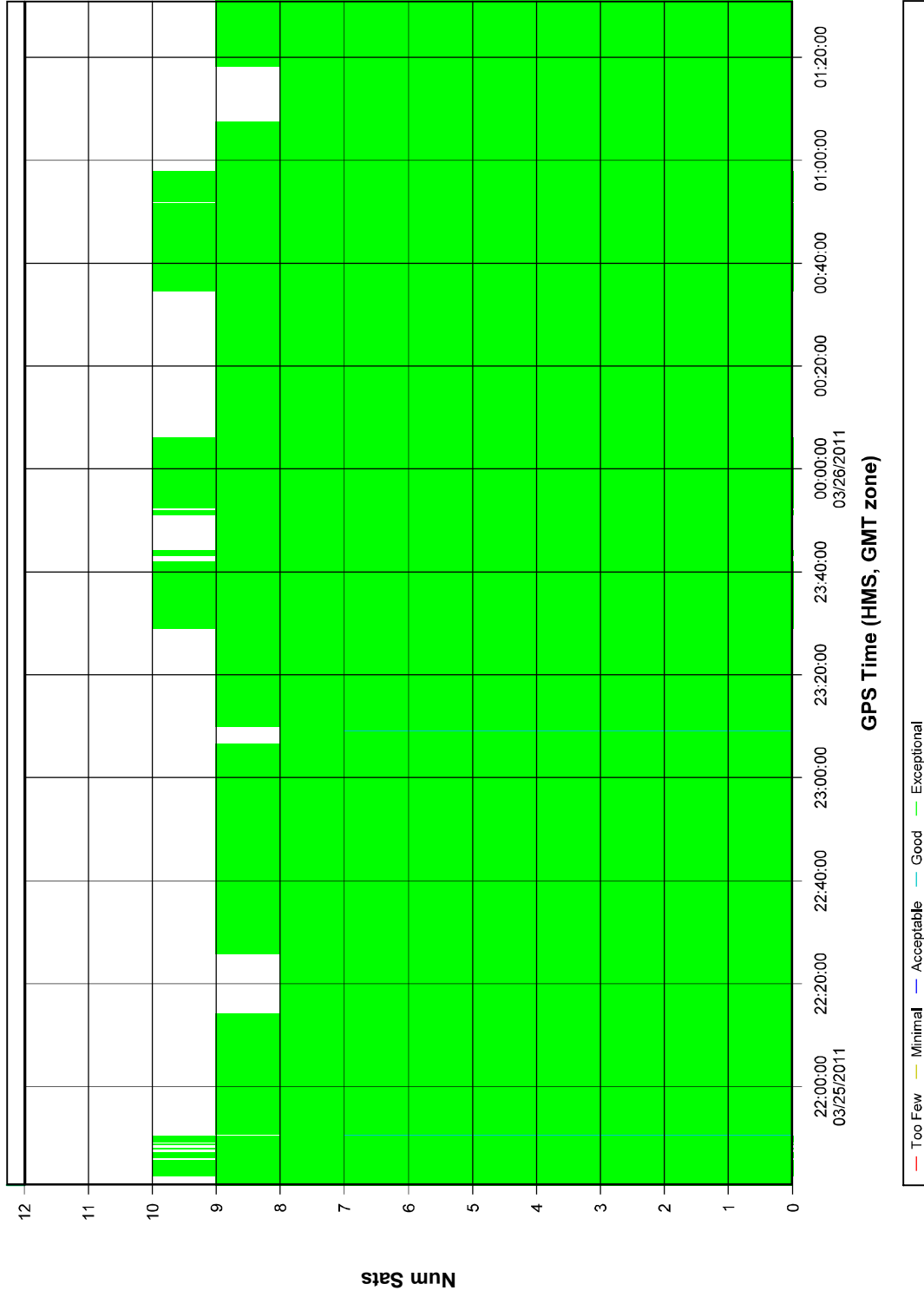
o111084b [Combined] - Forward/Reverse or Combined Separation Plot



o111084b [Combined] - PDOP, HDOP, VDOP Plots



o111084b [Combined] - Number of Satellites Bar Plot



Project # 111034 Session 01110846

Flight Log



Date	Mar 25/11	Julian Day	084
Project	FEMA Virginia	Aircraft	Newaygo
Staging		Call Sign	10045
Survey Block	Wardchester	Pilot	Race Barber
Lines Complete	42-55	Operator	Matthew
Mission Objective		Observer	NA

ALMIS Optech	0
System #	1
Laser Scanner	
Camera/Lens SN	NA
Shutter Speed	NA
Photo Freq.	NA
IMU	
GPS Rx	
Data Drive	

Additional Notes:

Outside Temp @ TO: 7
 Outside Pressure @ TO: 2994
 Outside Temp @ LA:
 Outside Pressure @ LA: 2798

Aircraft Block Time	<input type="checkbox"/> Times confirmed with pilot
Engine On (Hobbs)	Ramp Out
17:23	Talkoff 17:50
Engine Off (Hobbs)	Ramp In
21:32	Landing 21:17
Total Hrs (Hobbs)	Total hrs
4.1	3.5

Flying Height AGL	Scan Angle (Optech)
950m	
Ground Speed	Mirror Scan Rate
150 kts	
First Last/Alternating Return	Laser Pulse Rate

Static & KAR	GPS // INS Alignment		
Time	<input type="checkbox"/> GPS	Start	End
Pre Mission		17:23	17:29
KAR Base		17:37	17:47
KAR Base		21:21	21:31
Post Mission		21:21	21:32

Flight Plan Line #	LIDAR File Name	Flight Direction	GPS / UTC Time		Flight Aborted		Photo Events / Comments Please periodically record: Cabin Temp Cabin Humid Cabin Press
			Start	End	Time	NM to End	
55		S	17:56	18:11			
54		N	18:17	18:29			
53		S	18:41	18:49			
52		N	18:54	19:02			
51		S	19:07	19:14			
50		N	19:19	19:27			
49		S	19:33	19:40			
48		N	19:46	19:53			
47		S	19:59	20:06			
46		N	20:11	20:19			

GPS Base Log Sheet



Station ID:	Base 12	Project #:	111034	Missions:	d11084
-------------	---------	------------	--------	-----------	--------

Project Name:	FEMA Virginia	Calendar Date:	Mar 25/11	Julian Day	084
Approx. Coordinates	WGS 84	N	381822.12	W	750740.45
Description of Mark (Take Photos)					
Monument is:	<input type="checkbox"/> Flush with ground	<input checked="" type="checkbox"/> Above ground	2.5	cm	<input type="checkbox"/> Below ground _____ cm
Location & Access					

Observations & Additional Notes
Backup: Approx. Coordinates: WGS 84
N
W

GPS Observation - MAIN

Rx Make / Model	GSR 2600	Serial #	0020
Ant Make / Model	SK 600	Serial #	0010
Operator	Matt W		
Session Time (GPS)	Start	End	
	14:56	1:46	
Slant HI Before:	A: 1.492	B: 1.492	
Slant HI After:	A: 1.492	B: 1.492	
Correction			
Phase Center			
Data File Name	00200840.pdc		

GPS Observation - Back-Up

Rx Make / Model		Serial #	
Ant Make / Model		Serial #	
Operator			
Session Time (GPS)	Start	End	
Slant HI Before:	A:	B:	
Slant HI After:	A:	B:	
Correction			
Phase Center			
Data File Name			

```

                                o111084b.cfg
; PROJECT:      C:\Documents and
Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084b\3_Processed\GPS\o111084b.cfg
;
; DATE:         March 28/11 (date/time of processing)
; TIME:         21:17:17
; CREATED BY:   GrafNav Version 7.80.2517
;
VERSION = 7.80.2517
PROCUSER = Unknown
PRODESC = Run*(5)
PROCTIME = 21:16:48 03/28/2011

; Master station # 1 information
MB_MASTER_INDEX = 0
MB_MASTER_NAME = 1110312
MB_MASTER_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084b\1_RawData\original_PDC_files\Base12_0020_0840.gpb
MB_MASTER_POS = 38 18 22.12367 -75 07 40.46389 -33.7920
MB_MASTER_ANT = 1.526 0.001 1.492 1 _TP_SOK600 0
MB_MASTER_DISABLE = OFF

; Remote station information
REMOTE_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111084b\3_Processed\Extract\mgps_o111084b.gpb
REMOTE_POS = 38 18 33.90686 -75 07 05.25349 -29.6802
REMOTE_ANT = 0.000

; General settings
PROCESS_MODE = 105 108 113 126 ; Processing modes (GrafNav only)

DATUM = NAD83 AUTO ; Processing Datum
INPDATUM = ON NAD83 AUTO ; Input Datum (ON=Use processing datum)
ELEV_MASK = 10.0 ; Elevation mask (deg)
GRID = UTM 15 31 ; Grid info

CYCLE_TEST = BOTH ; Cycle slip test method
STATIC_SLIP_TOL = 0.40 ; slip tolerance in static mode (cycles)
USE_DOPPLER = ON OFF ; Use doppler meas. for phase, for code-only

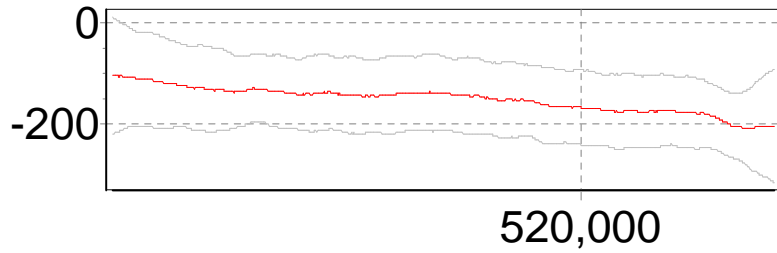
BASE_SAT = 99 ; Base satellite (99-default)

TIMERANGE = RANGE 985124445.0 985138259.5 2 0 ; Processing time range
INTERVAL = 0.10 ; Processing time interval (seconds)

PROCESS_DIR = FORWARD ; Process direction (FORWARD/REVERSE)
BOTH_DIR = ON ; True for processing both directions
WRITE_BAD_EPOCHS = OFF ; Save bad data to .fwd/rev file (ON/OFF)
NOWRITE_HIGH = OFF 6 20.000 ; Don't write epoch with high statistics (q, stdev-m)
OUTPUT_MODE = EXTENDED ; Format for .fwd/rev file
DETAILED_SUM = ON ; Detailed Static/KAR Summary header
WRITE_SLIP_MSG = ON ; Print cycle slips to message log
SAVE_AMB = ON ; Should ambiguities be saved

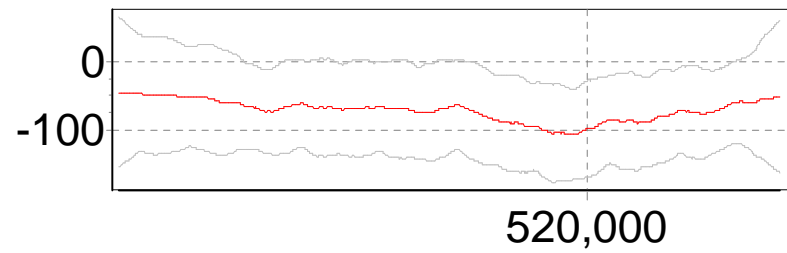
```

X Accelerometer Bias (micro-g)



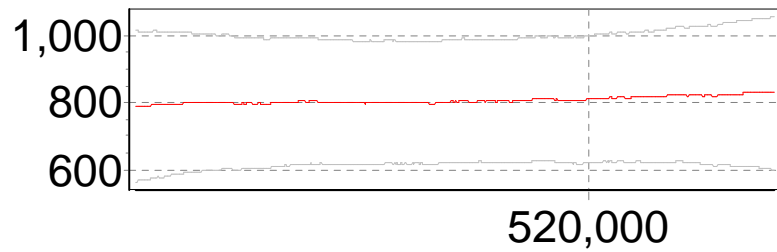
Time (seconds)

Y Accelerometer Bias (micro-g)



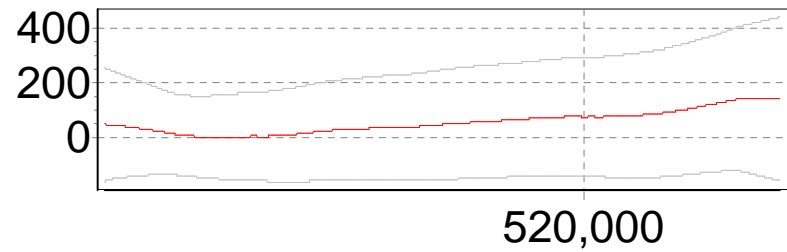
Time (seconds)

Z Accelerometer Bias (micro-g)



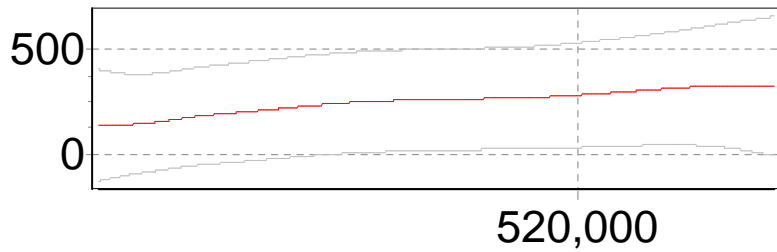
Time (seconds)

Accelerometer Scale Factor Error (ppr)



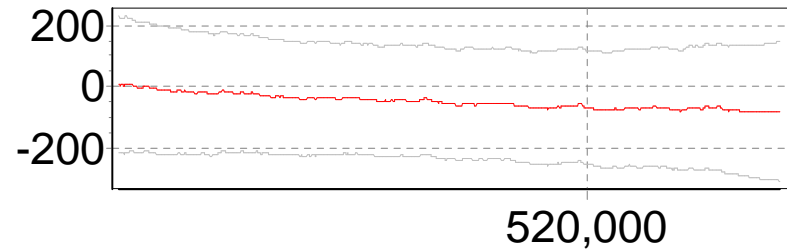
Time (seconds)

Accelerometer Scale Factor Error (ppr)

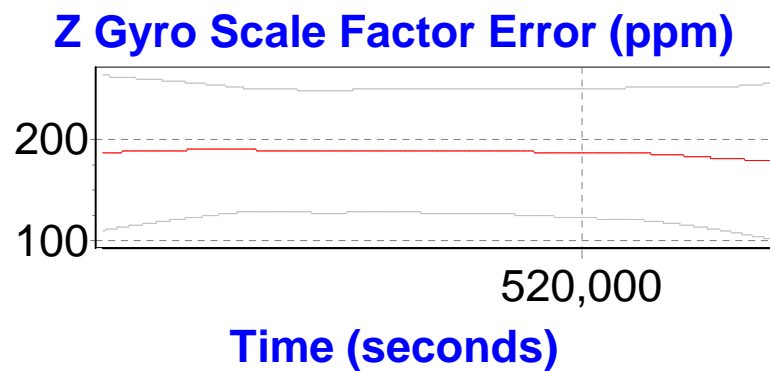
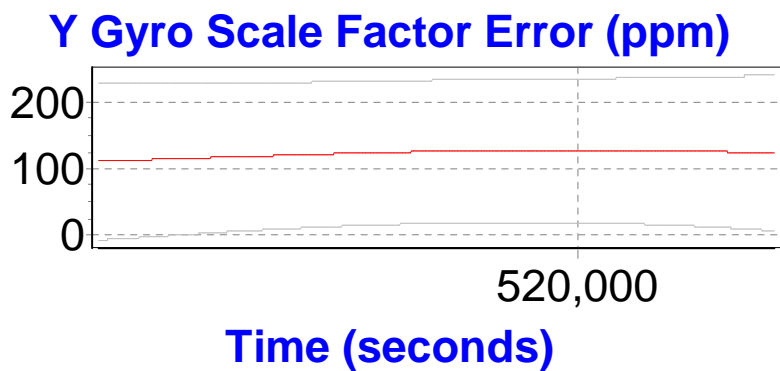
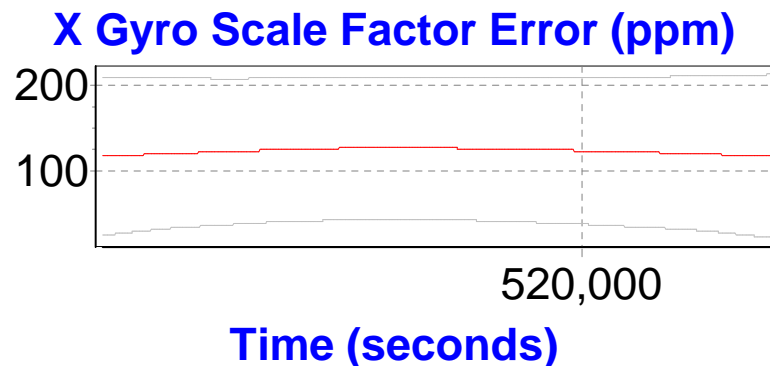
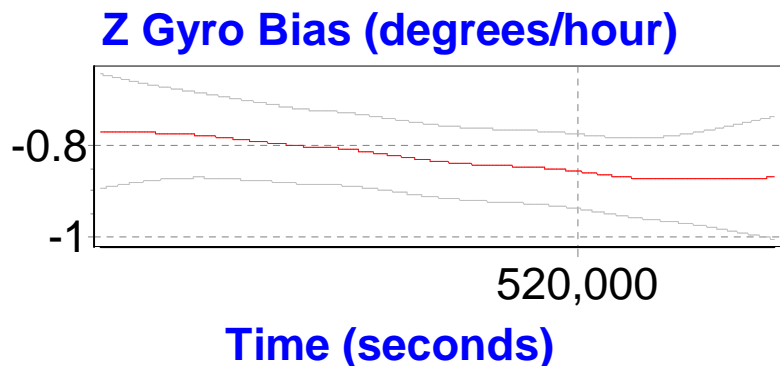
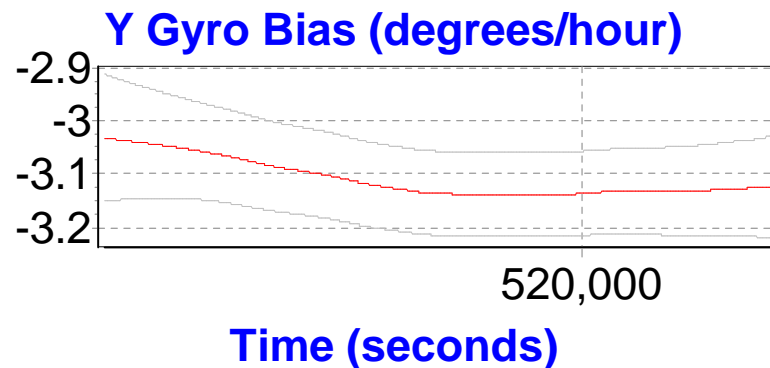
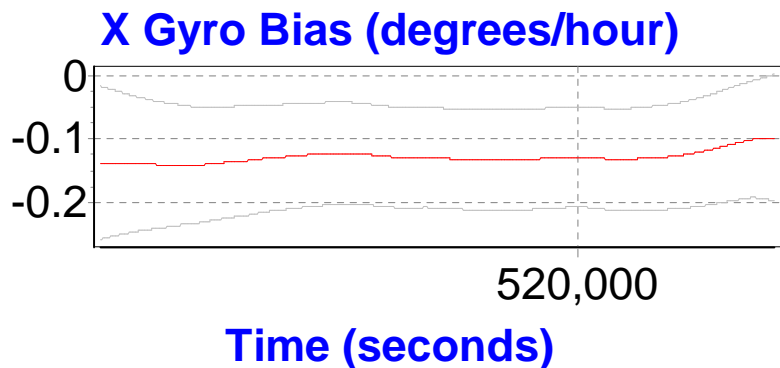


Time (seconds)

Accelerometer Scale Factor Error (ppr)

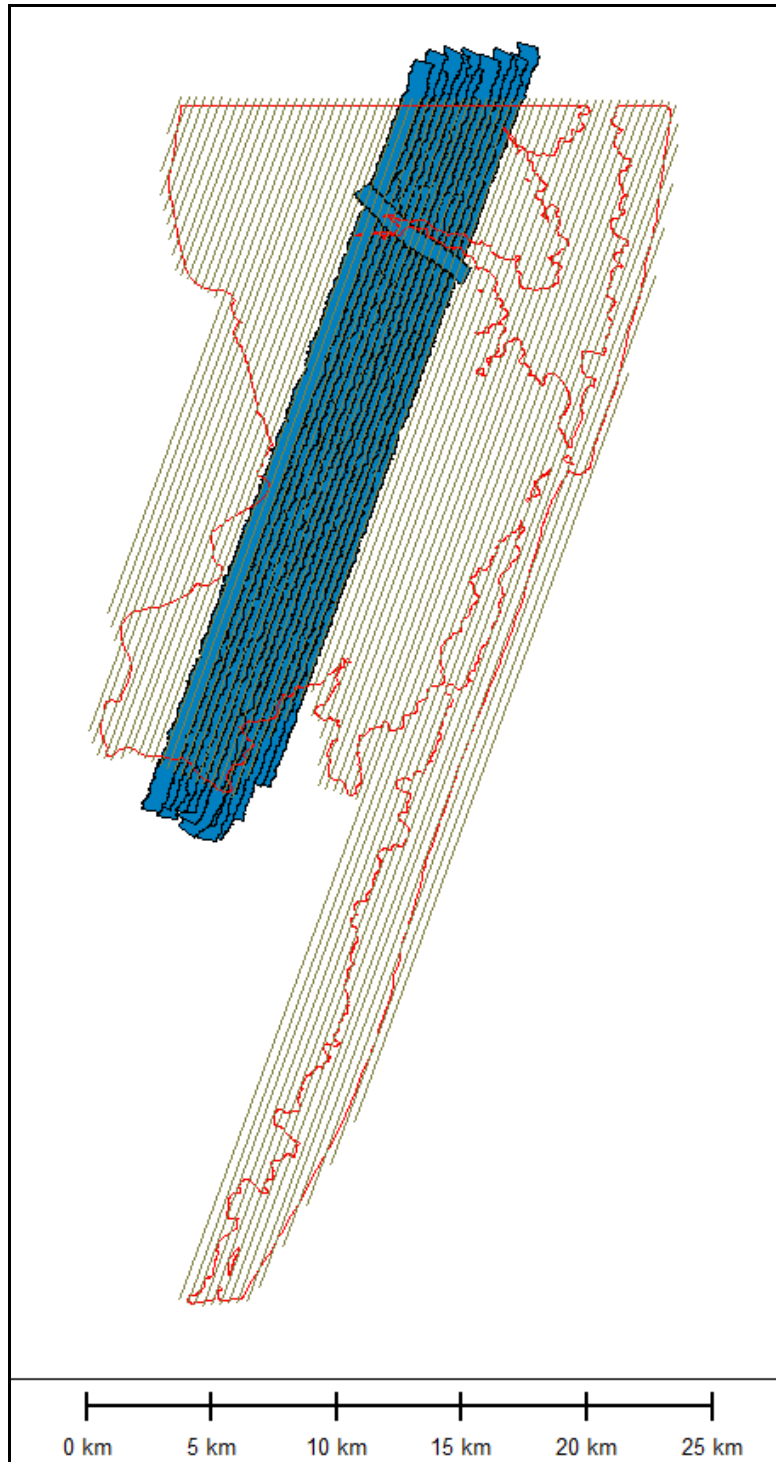


Time (seconds)



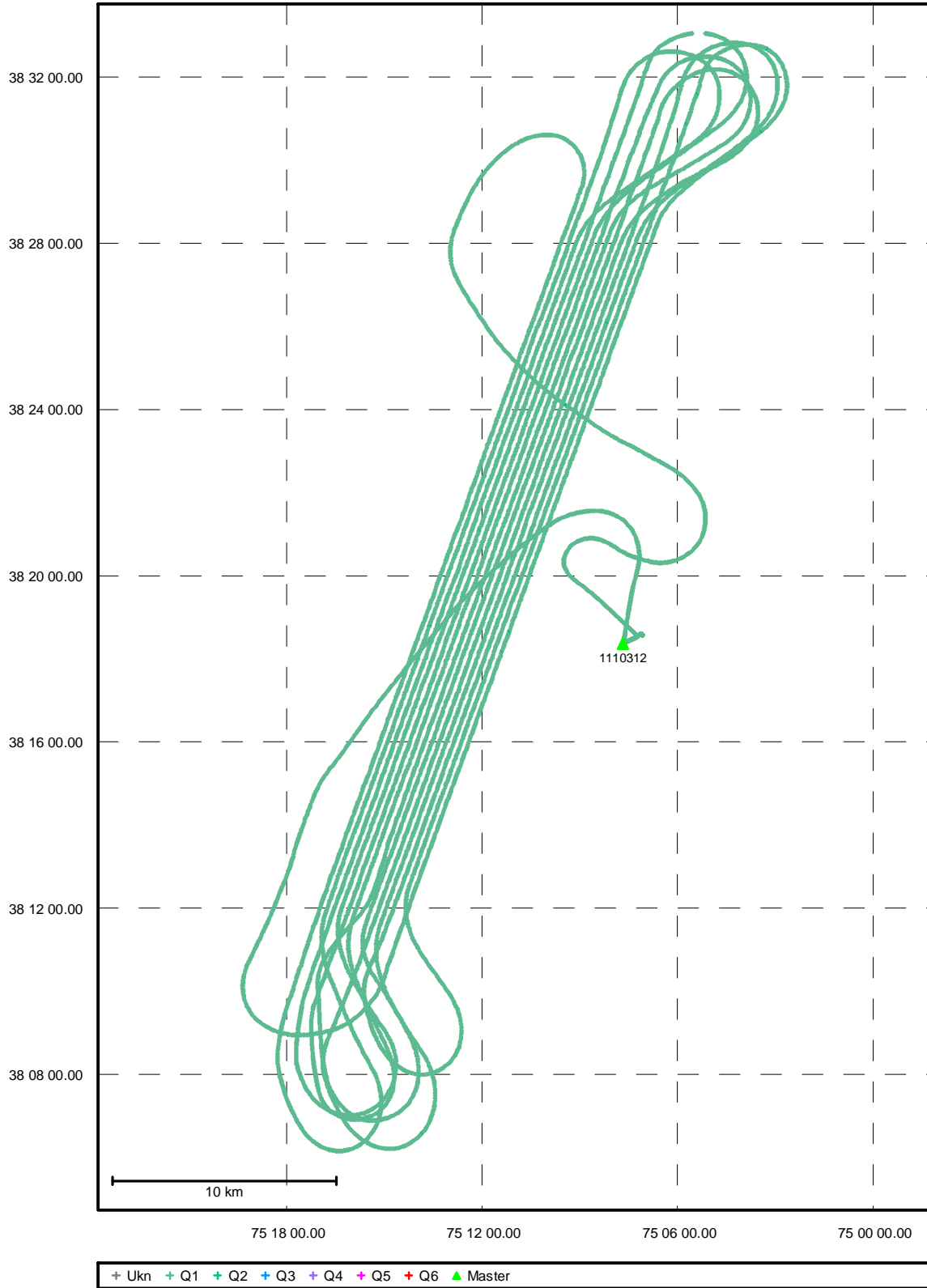
Mission: o111085a

2011 03 26



Combined - Map Run (2)

Geographic, DMS



Processing Summary Information

Program: GrafNav
Version: 7.80.2517
Project: C:\Documents and Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111085a\3_Processed\GPS\o111085a.cfg

Solution Type: Combined Fwd/Rev

Number of Epochs:

Total in GPB file:	120141
No processed position:	108139
Missing Fwd or Rev:	3
With bad C/A code:	0
With bad L1 Phase:	0

Measurement RMS Values:

L1 Phase:	0.0165 (m)
C/A Code:	0.76 (m)
L1 Doppler:	0.032 (m/s)

Fwd/Rev Separation RMS Values:

East:	0.006 (m)
North:	0.010 (m)
Height:	0.015 (m)

Fwd/Rev Sep. RMS for 25%-75% weighting (11997 occurrences):

East:	0.005 (m)
North:	0.009 (m)
Height:	0.014 (m)

Quality Number Percentages:

Q 1:	99.8 %
Q 2:	0.2 %
Q 3:	0.0 %
Q 4:	0.0 %
Q 5:	0.0 %
Q 6:	0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m:	100.0 %
0.10 - 0.30 m:	0.0 %
0.30 - 1.00 m:	0.0 %
1.00 - 5.00 m:	0.0 %
5.00 m + over:	0.0 %

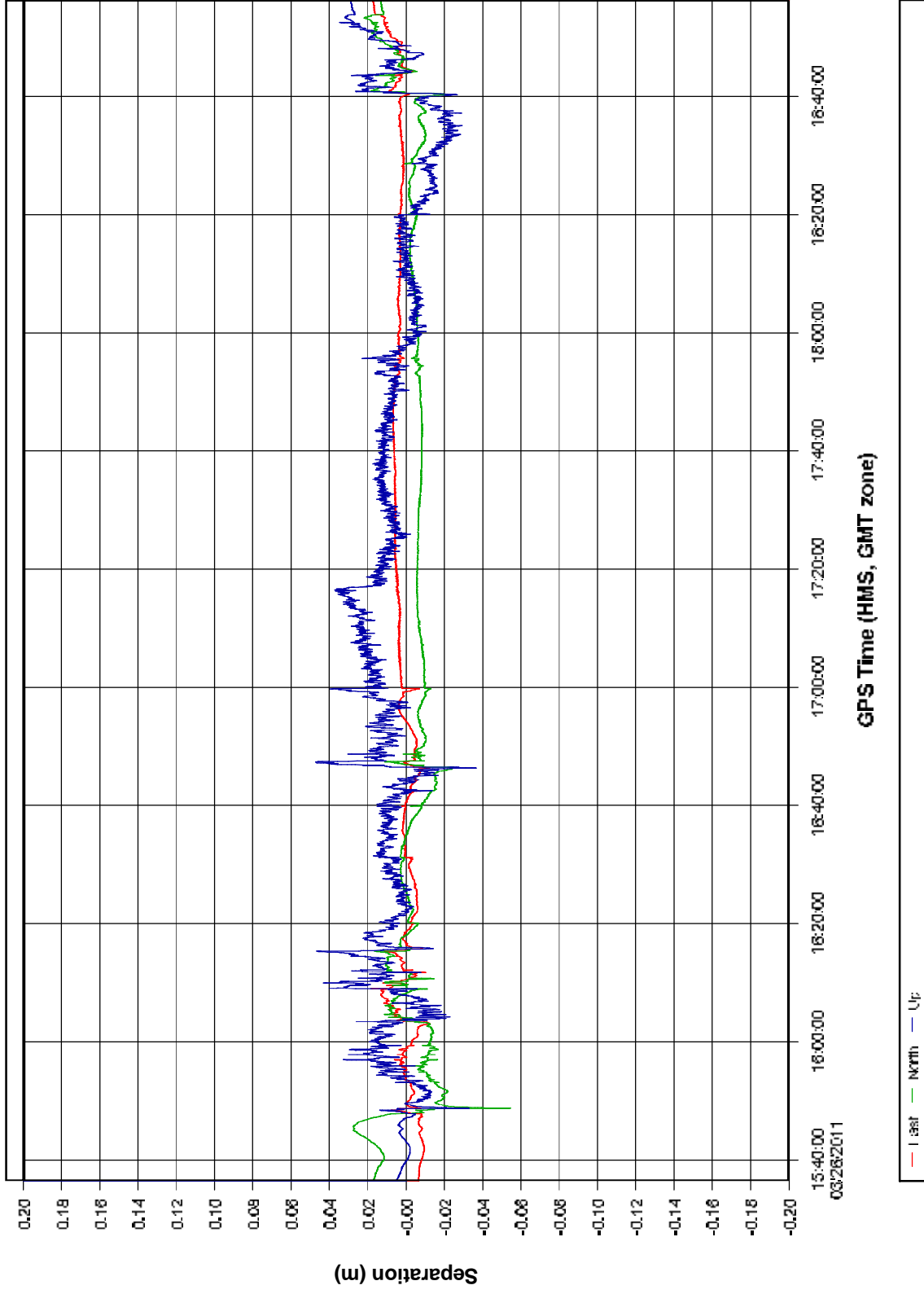
Percentages of epochs with DD_DOP over 10.00:

DOP over Tol:	0.0 %
---------------	-------

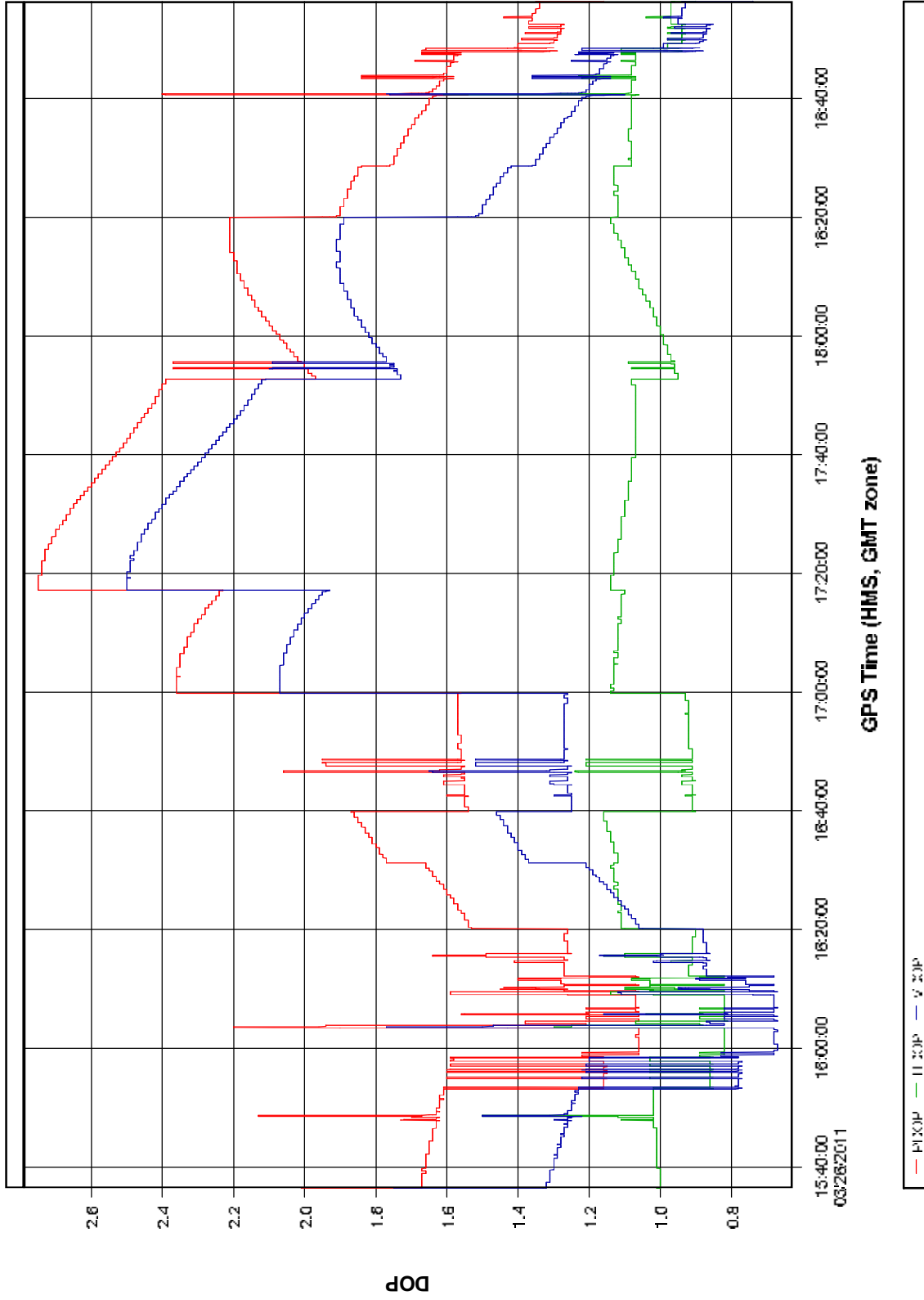
Baseline Distances:

Maximum:	27.432 (km)
Minimum:	0.045 (km)
Average:	13.400 (km)
First Epoch:	0.943 (km)
Last Epoch:	0.936 (km)

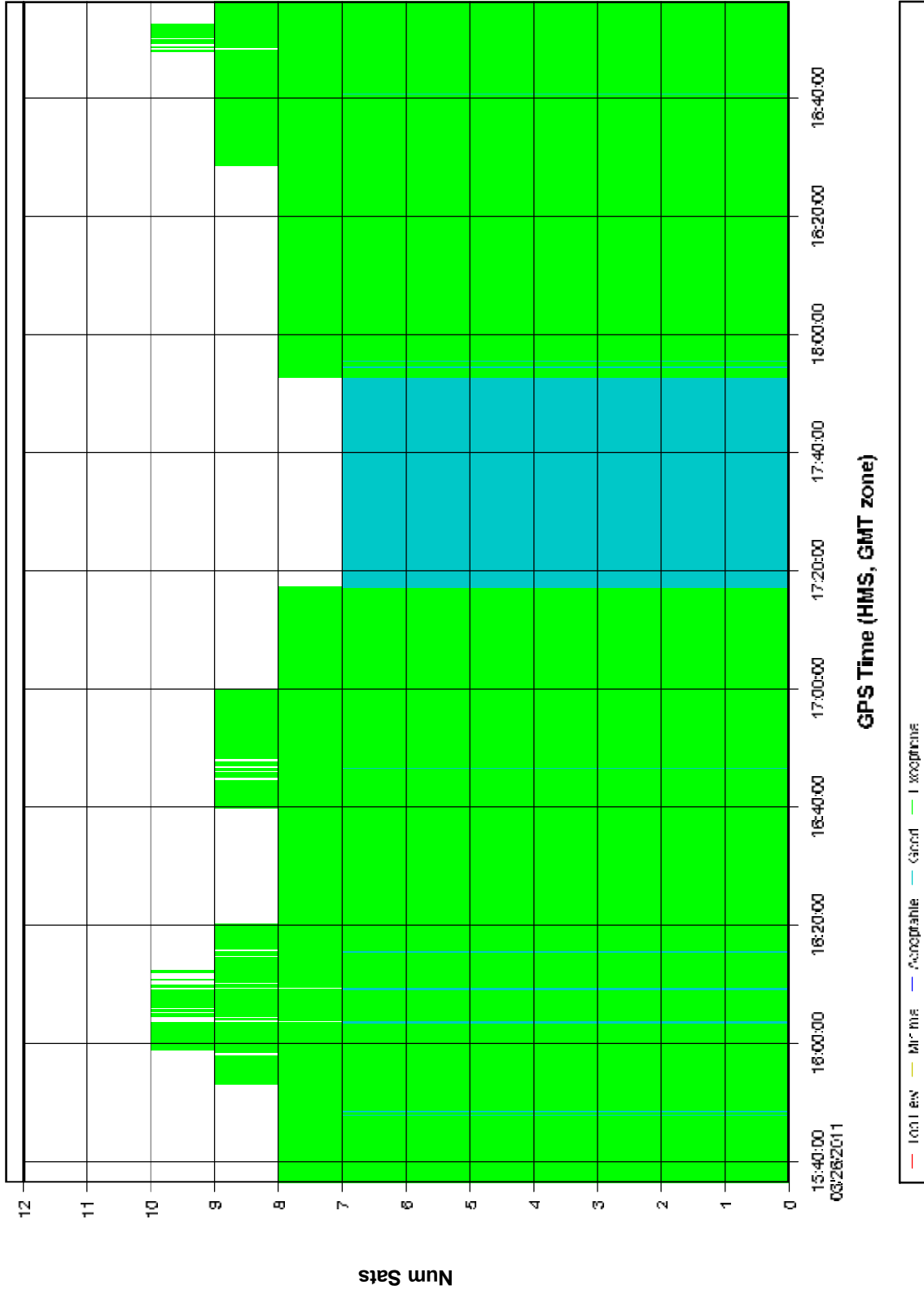
o111085a [Combined] - Forward/Reverse or Combined Separation Plot



o111085a [Combined] - PDOP, HDOP, VDOP Plots



o111085a [Combined] - Number of Satellites Bar Plot





Flight Log

Project # 111031 Session 0111085

Date	<u>May 26/11</u>	Julien Day	<u>065</u>
Project	<u>Fire Virginia</u>	Aircraft	<u>Newby</u>
Staging	<u>Warehaster</u>	Cell Sgn	<u>1009B</u>
Survey Block	<u>29-41</u>	Pilot	<u>Peace Biles</u>
Lines Complet		Operator	<u>Matthew</u>
Mission Objectives		Observer	<u>NA</u>

ALMIS/Optech	<u>0</u>
System #	<u>1</u>
Laser Scanner	
Camera/Lens SN	<u>NA</u>
Shutter Speed	<u>NA</u>
Photo Freq.	<u>NA</u>
MU	
GPS Rx	
Data Drive	

Additional Notes:
 Outside Temp @ TO: 6 Outside Pressure @ TO: 3007
 Outside Temp @ LA: 6 Outside Pressure @ LA: 3004

Aircraft Block Time	<input type="checkbox"/> Times confirmed with pilot
Engine On (Hobbs)	Ramp Out
<u>11:29</u>	<u>11:48</u>
Engine Off (Hobbs)	Ramp In
<u>14:58</u>	<u>14:47</u>
Total hrs (Hobbs)	Total hrs
<u>3.5</u>	<u>3.0</u>

Mission Plan	Scan Angle (Optech)
Flying Height AGL	<u>950</u>
Ground Speed	Mirror Scan Rate
<u>150</u>	Laser/Pulse Rate
First Last/Alternating Return	

Static & KAR	GPS // INS Alignment
Time <input type="checkbox"/> GPS	Start
Pre Mission	<u>11:29</u>
KAR Base	<u>11:44</u>
KAR Base	<u>11:34</u>
KAR Base	<u>14:47</u>
Post Mission	<u>14:58</u>

Flight Plan Lins #	LIDAR File Name	Flight Direction	GPS / UTC Time		Flight Aborted	Photo Events / Comments
			Start	End		
<u>41</u>		<u>N</u>	<u>12:00</u>	<u>12:06</u>		
<u>40</u>		<u>S</u>	<u>12:18</u>	<u>12:30</u>		
<u>39</u>		<u>N</u>	<u>12:24</u>	<u>12:31</u>		
<u>38</u>		<u>S</u>	<u>12:37</u>	<u>12:44</u>		
<u>37</u>		<u>N</u>	<u>12:48</u>	<u>12:57</u>		
<u>36</u>		<u>S</u>	<u>13:02</u>	<u>13:09</u>		
<u>35</u>		<u>N</u>	<u>13:14</u>	<u>13:21</u>		
<u>34</u>		<u>S</u>	<u>13:26</u>	<u>13:32</u>		
<u>33</u>		<u>N</u>	<u>13:38</u>	<u>13:45</u>		
<u>32</u>		<u>S</u>	<u>13:51</u>	<u>13:58</u>		

GPS Base Log Sheet



Station ID:	Base 12	Project #:	11103U	Missions:	011085
-------------	---------	------------	--------	-----------	--------

Project Name:	FEMA Virginia	Calendar Date:	Mar 26/11	Julian Day	085
Approx. Coordinates WGS84	N 38 18 22.12	W	75 74.45		

Description of Mark (Take Photos)

Monument is: Flush with ground Above ground 2.5 cm Below ground _____ cm

Location & Access

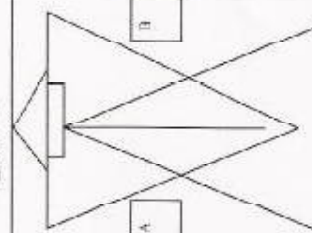
Obstructions & Additional Notes

Backup: Approx. Coordinates WGS 34

N
W

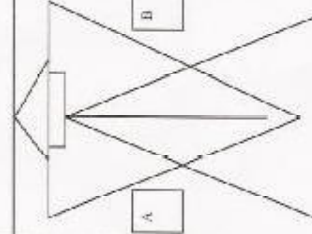
GPS Observation - MAIN

Rx Make / Model	GSR 2600	Serial #	6220
Ant Make / Model	SX 600	Serial #	0010
Operator	Matthew		
Session Start	15:03		
Time (GPS) End	19:08		
Slant HI Before:	A: 1.492	B: 1.492	
Slant HI After:	A: 1.492	B: 1.492	
Correction			
Phase Center		<input type="checkbox"/> m <input type="checkbox"/> in <input type="checkbox"/> use GrafNav Profile	
Data File Name	00200850 00200850.pdc		



GPS Observation - Back-Up

Rx Make / Model		Serial #	
Ant Make / Model		Serial #	
Operator			
Session Start			
Time (GPS) End			
Slant HI Before:	A:	B:	
Slant HI After:	A:	B:	
Correction			
Phase Center		<input type="checkbox"/> m <input type="checkbox"/> in <input type="checkbox"/> use GrafNav Profile	
Data File Name			



```

                                o111085a.cfg
; PROJECT:      C:\Documents and
Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111085a\3_Process
sed\GPS\o111085a.cfg
;
; DATE:         March 28/11 (date/time of processing)
; TIME:         21:07:34
; CREATED BY:   GrafNav Version 7.80.2517
;
VERSION = 7.80.2517
PROCUSER = Unknown
PRODESC = Run*(3)
PROCTIME = 21:04:56 03/28/2011

; Master station # 1 information
MB_MASTER_INDEX = 0
MB_MASTER_NAME = 1110312
MB_MASTER_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\
o111085a\1_RawData\original_PDC_files\Base12_0020_0850.gpb
MB_MASTER_POS = 38 18 22.12367 -75 07 40.46389 -33.7920
MB_MASTER_ANT = 1.526 0.001 1.492 1 _TP_SOK600 0
MB_MASTER_DISABLE = OFF

; Remote station information
REMOTE_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\
o111085a\3_Processed\Extract\mgps_o111085a.gpb
REMOTE_POS = 38 18 33.98637 -75 07 04.67526 -35.1842
REMOTE_ANT = 0.000

; General settings
PROCESS_MODE = 103 109 113 124 ; Processing modes (GrafNav only)

DATUM = NAD83 AUTO ; Processing Datum
INPDATUM = ON NAD83 AUTO ; Input Datum (ON=Use processing datum)
ELEV_MASK = 10.0 ; Elevation mask (deg)
GRID = UTM 15 31 ; Grid info

CYCLE_TEST = BOTH ; Cycle slip test method
STATIC_SLIP_TOL = 0.40 ; slip tolerance in static mode (cycles)
USE_DOPPLER = ON OFF ; Use doppler meas. for phase, for code-only

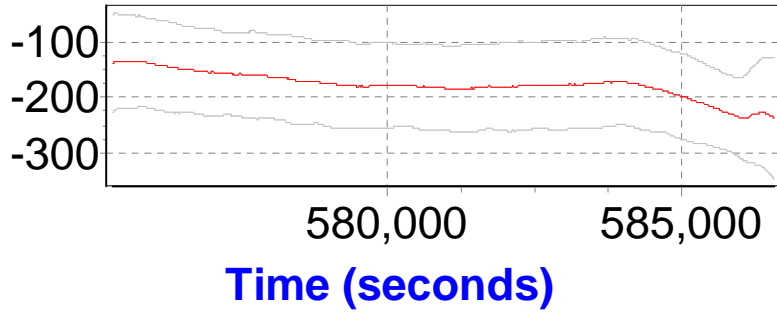
BASE_SAT = 99 ; Base satellite (99-default)

TIMERANGE = ALL 985188969.8 985200983.8 2 0 ; Processing time range
INTERVAL = 0.10 ; Processing time interval (seconds)

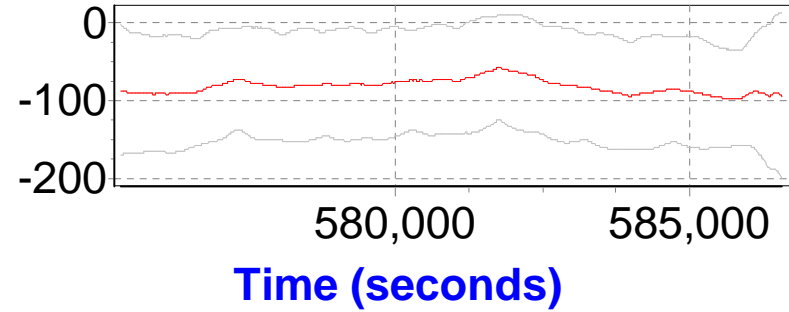
PROCESS_DIR = FORWARD ; Process direction (FORWARD/REVERSE)
BOTH_DIR = ON ; True for processing both directions
WRITE_BAD_EPOCHS = OFF ; Save bad data to .fwd/rev file (ON/OFF)
NOWRITE_HIGH = OFF 6 20.000 ; Don't write epoch with high statistics (q, stdev-m)
OUTPUT_MODE = EXTENDED ; Format for .fwd/rev file
DETAILED_SUM = ON ; Detailed Static/KAR Summary header
WRITE_SLIP_MSG = ON ; Print cycle slips to message log
SAVE_AMB = ON ; Should ambiguities be saved

```

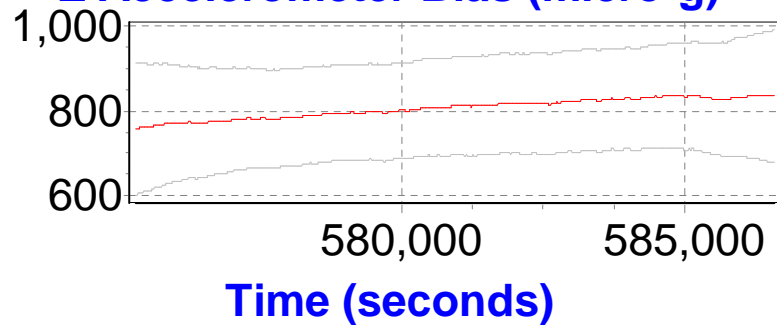
X Accelerometer Bias (micro-g)



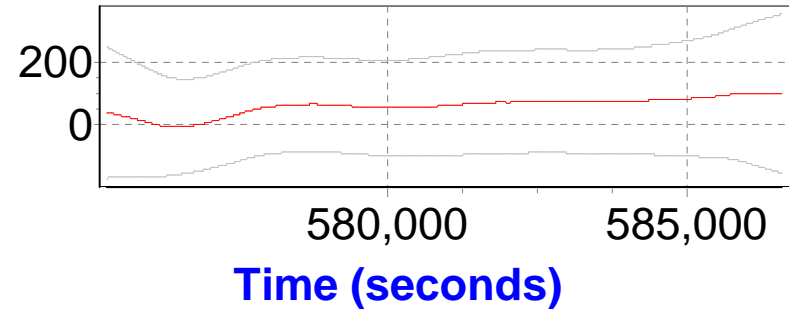
Y Accelerometer Bias (micro-g)



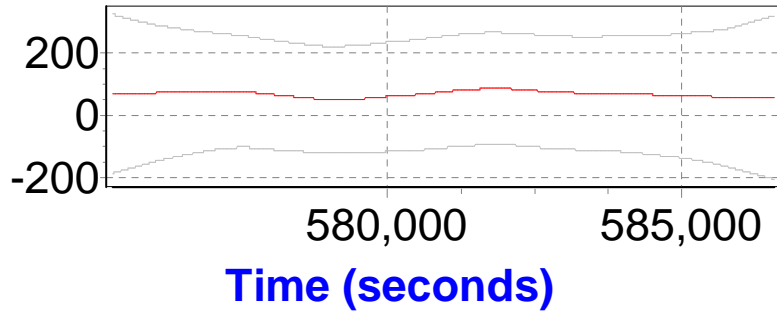
Z Accelerometer Bias (micro-g)



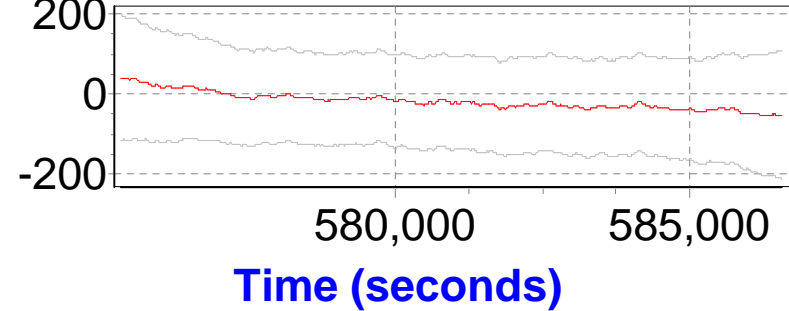
Accelerometer Scale Factor Error (ppr)

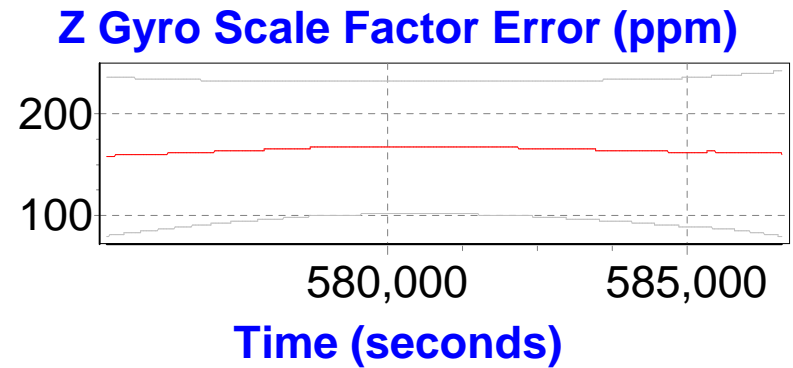
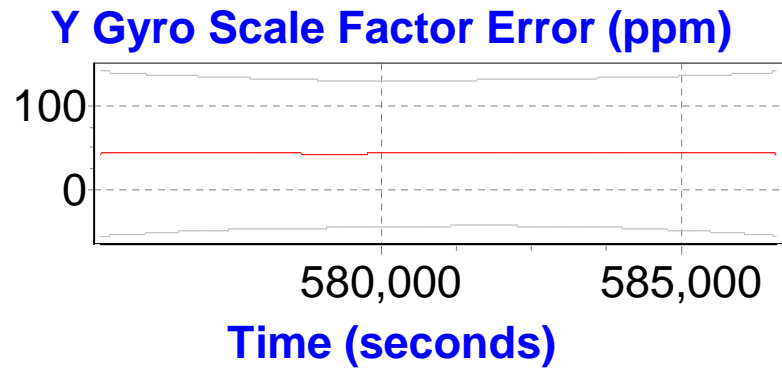
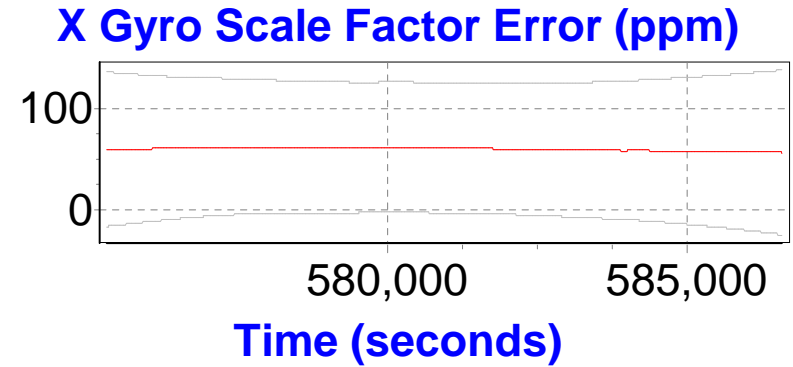
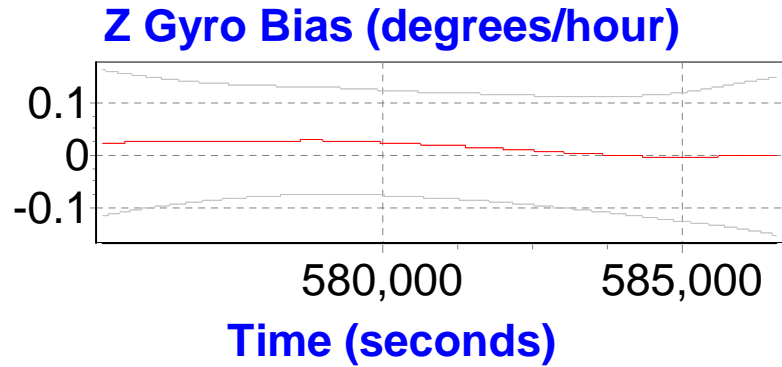
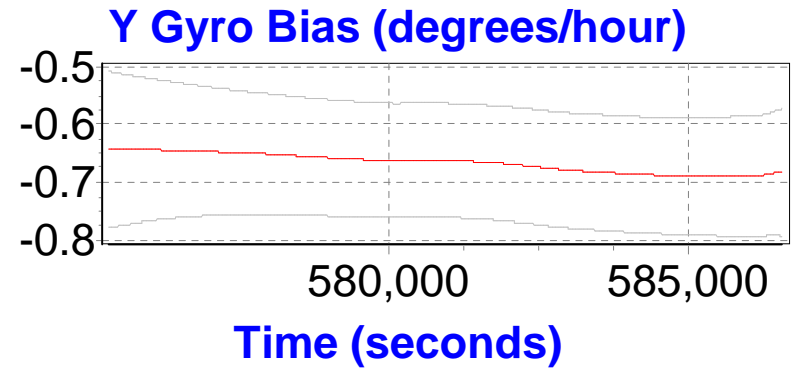
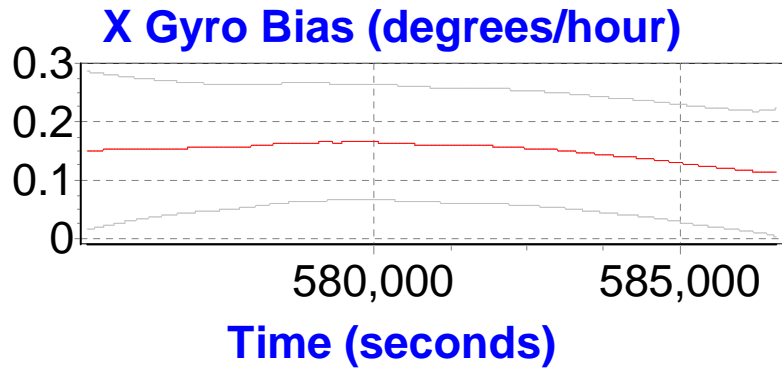


Accelerometer Scale Factor Error (ppr)



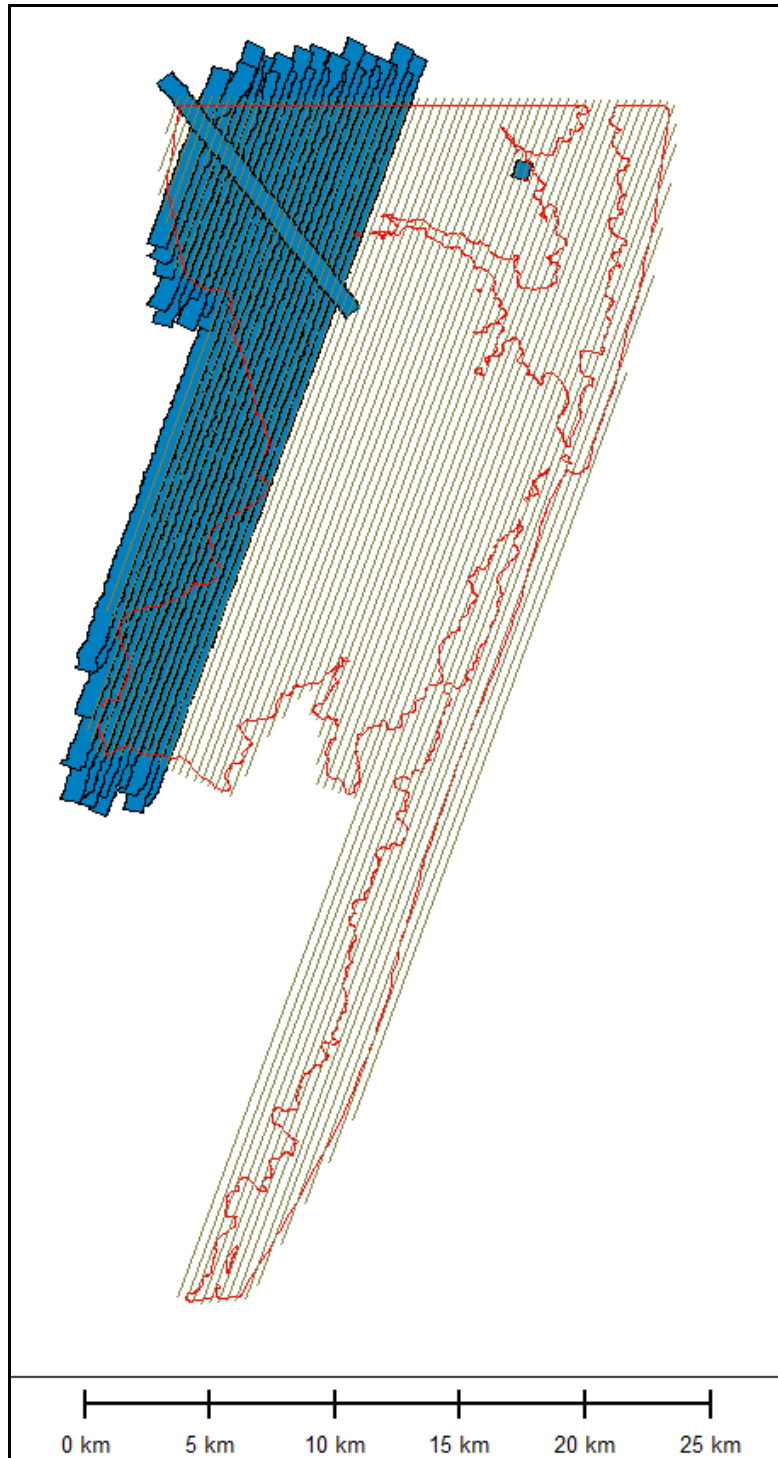
Accelerometer Scale Factor Error (ppr)





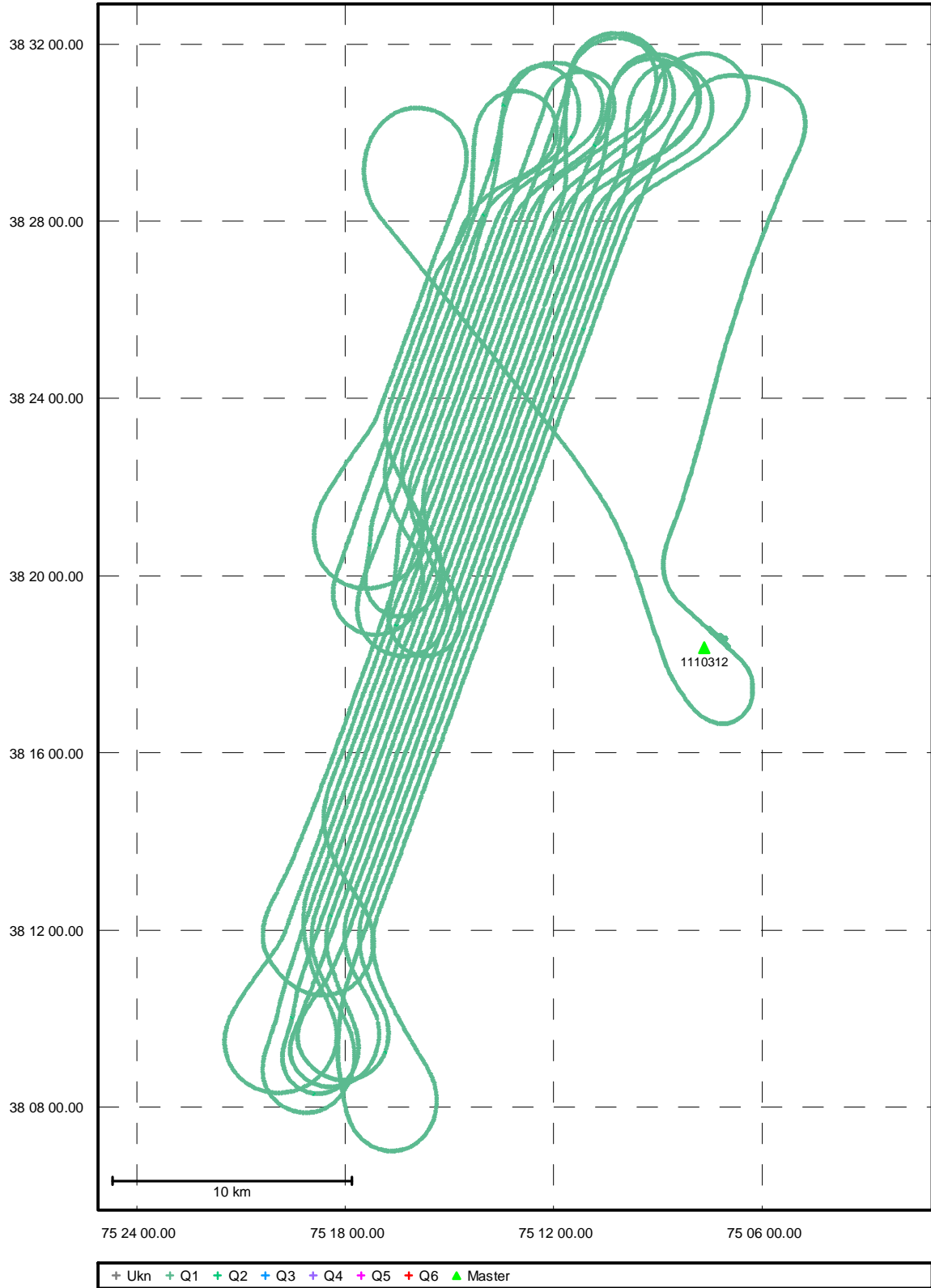
Mission: o111087a

2011 03 28



Combined - Map Run (2)

Geographic, DMS



Processing Summary Information

Program: GrafNav
Version: 7.80.2517
Project: C:\Documents and Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111087a\3_Processed\GPS\o111087a.cfg

Solution Type: Combined Fwd/Rev

Number of Epochs:

Total in GPB file:	152803
No processed position:	137546
Missing Fwd or Rev:	3
With bad C/A code:	0
With bad L1 Phase:	0

Measurement RMS Values:

L1 Phase:	0.0174 (m)
C/A Code:	0.78 (m)
L1 Doppler:	0.030 (m/s)

Fwd/Rev Separation RMS Values:

East:	0.011 (m)
North:	0.017 (m)
Height:	0.032 (m)

Fwd/Rev Sep. RMS for 25%-75% weighting (15252 occurrences):

East:	0.011 (m)
North:	0.017 (m)
Height:	0.030 (m)

Quality Number Percentages:

Q 1:	99.9 %
Q 2:	0.1 %
Q 3:	0.0 %
Q 4:	0.0 %
Q 5:	0.0 %
Q 6:	0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m:	100.0 %
0.10 - 0.30 m:	0.0 %
0.30 - 1.00 m:	0.0 %
1.00 - 5.00 m:	0.0 %
5.00 m + over:	0.0 %

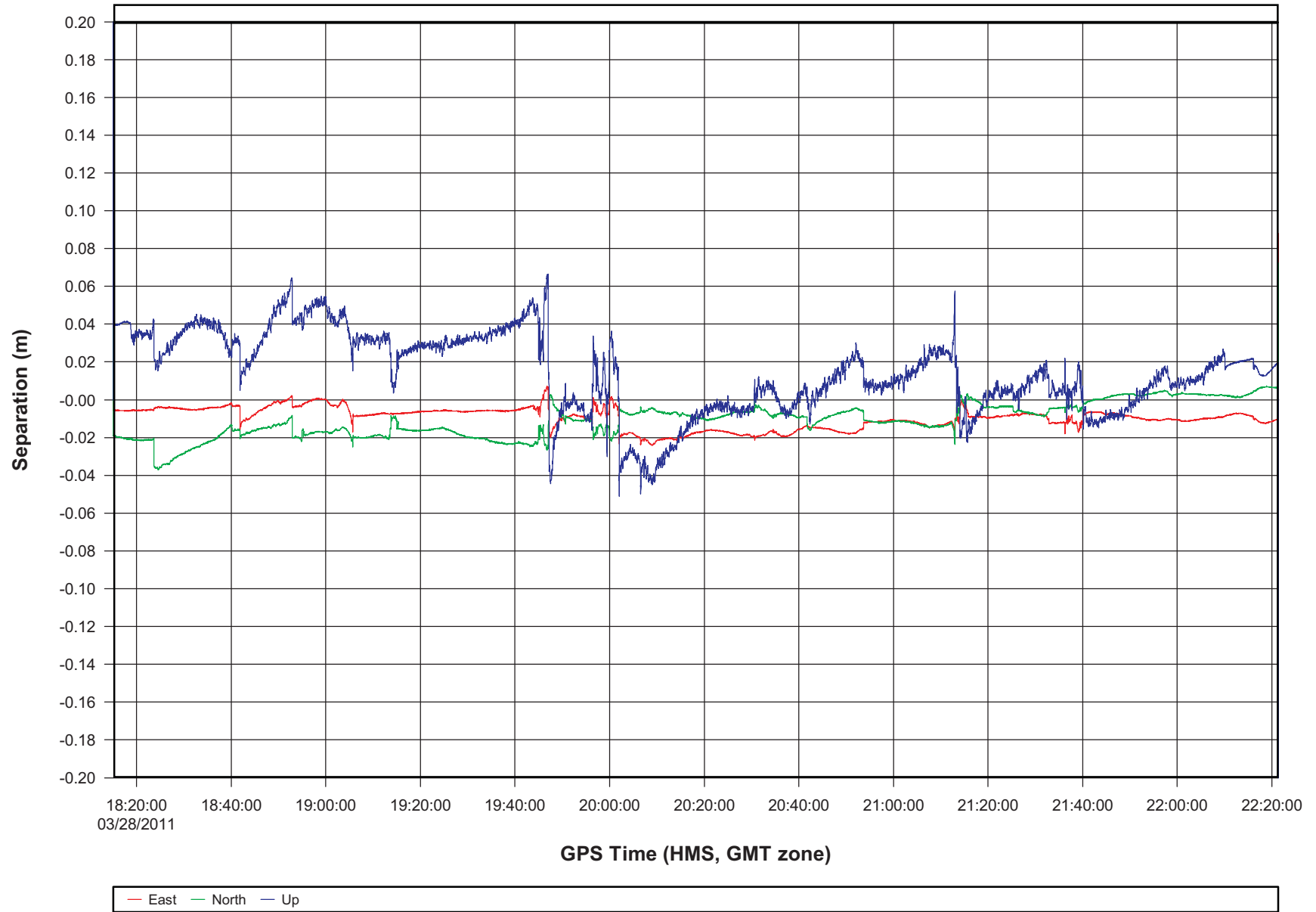
Percentages of epochs with DD_DOP over 10.00:

DOP over Tol:	0.0 %
---------------	-------

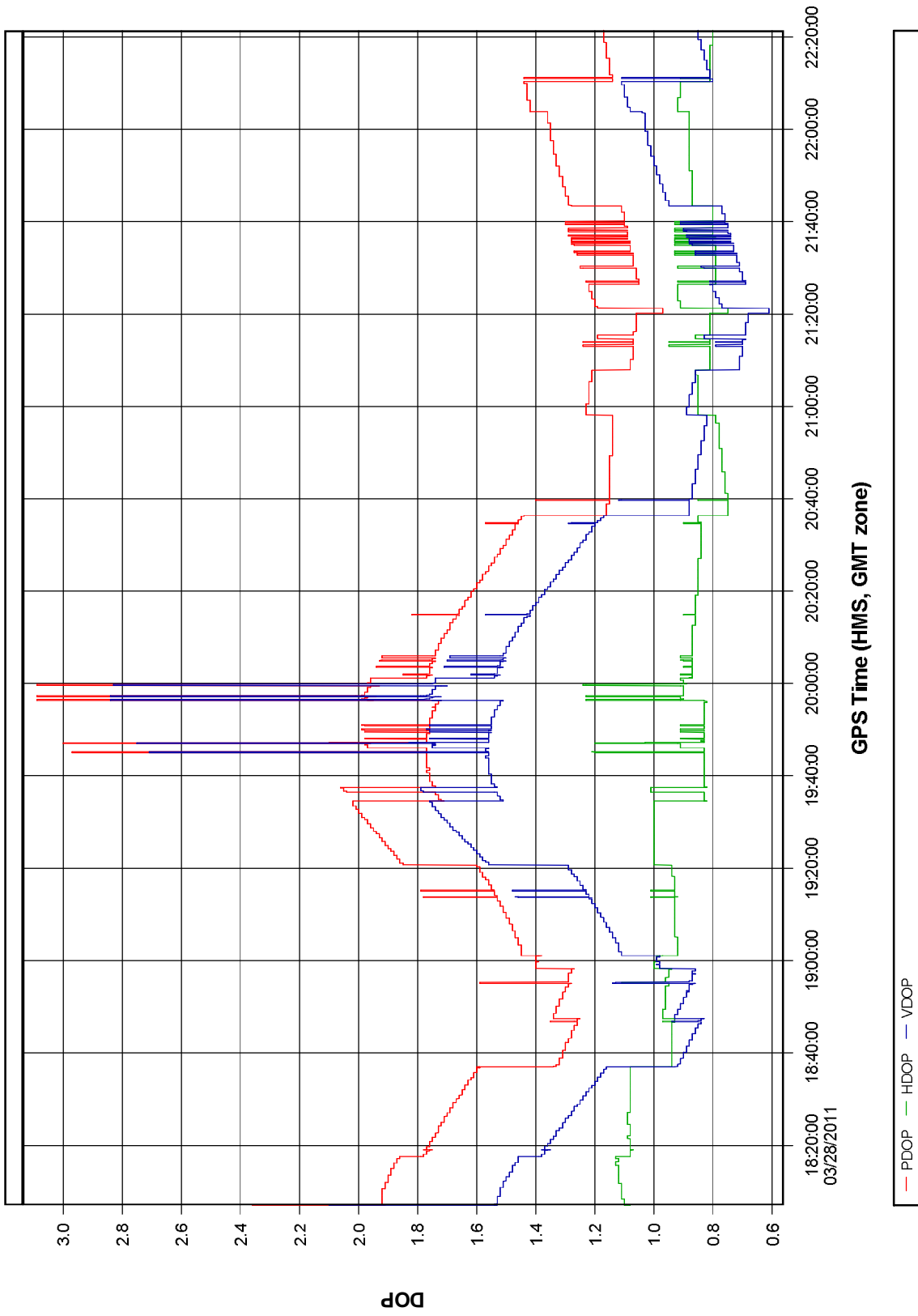
Baseline Distances:

Maximum:	26.516 (km)
Minimum:	0.692 (km)
Average:	15.361 (km)
First Epoch:	0.984 (km)
Last Epoch:	0.935 (km)

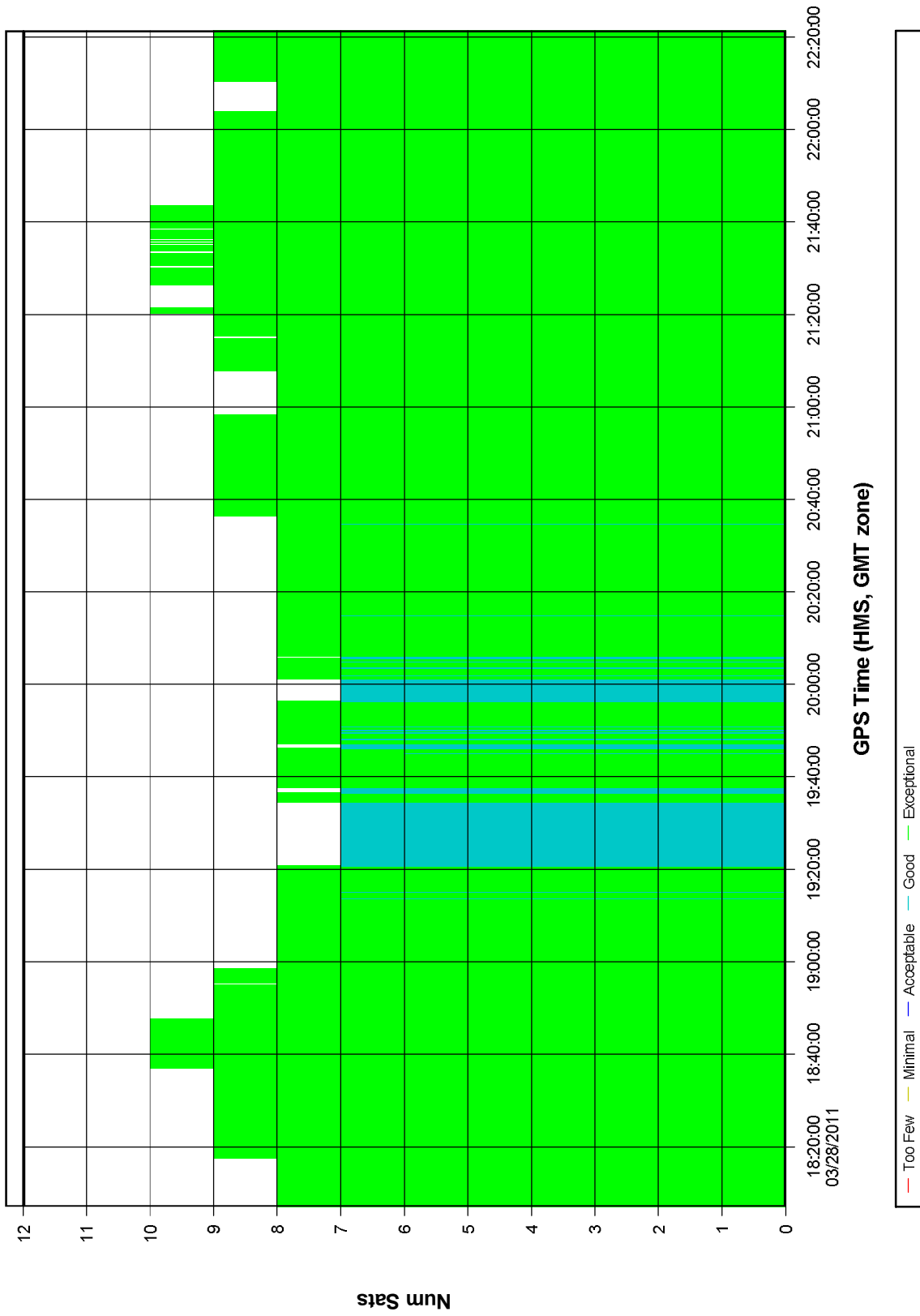
o111087a [Combined] - Forward/Reverse or Combined Separation Plot



o111087a [Combined] - PDOP, HDOP, VDOP Plots



o111087a [Combined] - Number of Satellites Bar Plot



Project # 111034 Session 0110820

Flight Log



Date	Nov 28/11	Julian Day	087
Project	FLYVA Virginia	Aircraft	NA
Saging	Green City	Call Sign	10095
Survey Block	Worcester	Pilot	Pace Baker
Lines Complete	- 28	Operator	Matthew
Mission Objective		Observer	NA

ALMIS/Optech	
System #	1
Laser Scanner	
Camera/Lens SN	NA
Shutter Speed	NA
Photo Freq.	NA
IMU	
GFS Rx	
Deck Drive	

Additional Notes:

Outside Temp @ TO: 8 Outside Pressure @ TO: 3004
 Outside Temp @ LA: 10 Outside Pressure @ LA: 3001

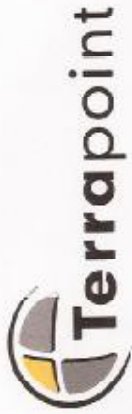
Aircraft	Block Time	<input type="checkbox"/> Times confirmed with pilot
Engine On (Hobbs)	Ramp Out	Takeoff
14:00		14:20
Engine Off (Hobbs)	Ramp In	Landing
18:25		18:10
Total hrs (Hobbs)	Total hrs	Total hrs
4.4		3.7

Flying Height AGL	Mission Plan	Scan Angle (Offset)
950		
Ground Speed		Minor Scan Rate
150		
First Last/Alternating Return		Laser Pulse Rate

Time	GPS	Start	End
Pre Mission	<input type="checkbox"/>	14:00	14:16
KAR Base		14:06	14:16
KAR Base		18:12	18:22
Post Mission			

Flight Plan Line #	LIDAR File Name	Flight Direction	GPS / UTC Time		Flight Aborted		Photo Events / Comments Please periodically record Cabin Temp Cabin Temp Outside Temp Laser Temp
			Start	End	Time	NM to End	
28		S	14:27	14:24			
27		N	14:39	14:47			
26		S	14:52	14:59			
25		N	15:04	15:10			
24		S	15:14	15:21			
23		N	15:25	15:33			
22		S	15:37	15:44			
21		N	15:48	15:56			
20		S	16:00	16:06			
19		N	16:10	16:17			

GPS Base Log Sheet



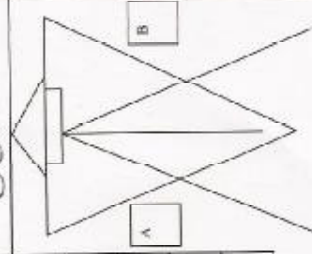
Station ID:	Base 12	Project #:	111036	Missions:	011097
-------------	---------	------------	--------	-----------	--------

Project Name:	FEMA Virginia	Calendar Date:	Mar 28/10	Julian Day	087
Approx. Coordinates	N 3818 22.12	W	7507 40.45		
Desc: pylon of Mark (Take Photos)					
Monuments:	<input type="checkbox"/> Flush with ground <input checked="" type="checkbox"/> Above ground 25 m <input type="checkbox"/> Below ground ___ cm				
Location & Access					

Obstructions & Additional Notes

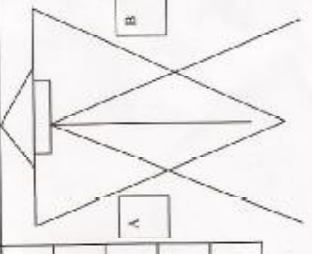
GPS Observation - MAIN

Rx Make/Model	GSK 2600	Serial #	0020
Ant Make/Model	SK600	Serial #	0010
Operator	Matthew		
Session Time (GPS)	Start	End	
	17:43	22:42	
Start HI Before:	A: 1.492	B: 1.492	
Start HI After:	A:	B:	
Correction			
Phase Center	<input type="checkbox"/> m <input type="checkbox"/> in <input type="checkbox"/> use GrafNav Profile		
Data File Name	0200870.pdc		



GPS Observation - Back-Up

Rx Make/Model		Serial #	
Ant Make/Model		Serial #	
Operator			
Session Time (GPS)	Start	End	
Start HI Before:	A:	B:	
Start HI After:	A:	B:	
Correction			
Phase Center	<input type="checkbox"/> m <input type="checkbox"/> in <input type="checkbox"/> use GrafNav Profile		
Data File Name			



```

                                o111087a.cfg
; PROJECT:      C:\Documents and
Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111087a\3_Processed\GPS\o111087a.cfg
;
; DATE:        March 29/11 (date/time of processing)
; TIME:        10:03:49
; CREATED BY:  GrafNav Version 7.80.2517
;
VERSION = 7.80.2517
PROCUSER = Unknown
PRODESC = Run*(3)
PROCTIME = 10:01:24 03/29/2011

; Master station # 1 information
MB_MASTER_INDEX = 0
MB_MASTER_NAME = 1110312
MB_MASTER_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111087a\1_RawData\original_PDC_files\Base12_0020_0870.gpb
MB_MASTER_POS = 38 18 22.12367 -75 07 40.46389 -33.7920
MB_MASTER_ANT = 1.526 0.001 1.492 1 _TP_SOK600 0
MB_MASTER_DISABLE = OFF

; Remote station information
REMOTE_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111087a\3_Processed\Extract\mgps_o111087a.gpb
REMOTE_POS = 38 18 34.82564 -75 07 03.32858 -36.3384
REMOTE_ANT = 0.000

; General settings
PROCESS_MODE = 105 108 113 126 ; Processing modes (GrafNav only)

DATUM = NAD83 AUTO ; Processing Datum
INPDATUM = ON NAD83 AUTO ; Input Datum (ON=Use processing datum)
ELEV_MASK = 9.0 ; Elevation mask (deg)
GRID = UTM 15 31 ; Grid info

CYCLE_TEST = BOTH ; Cycle slip test method
STATIC_SLIP_TOL = 0.40 ; slip tolerance in static mode (cycles)
USE_DOPPLER = ON OFF ; Use doppler meas. for phase, for code-only

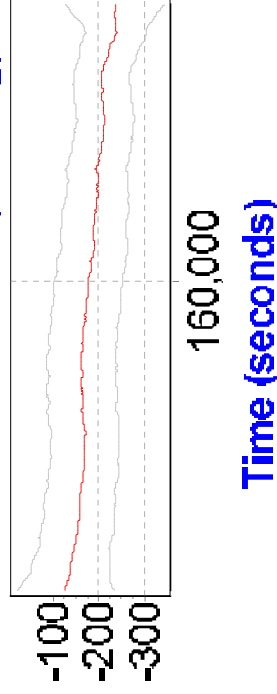
BASE_SAT = 99 ; Base satellite (99-default)

TIMERANGE = ALL 985370803.0 985386083.2 2 0 ; Processing time range
INTERVAL = 0.10 ; Processing time interval (seconds)

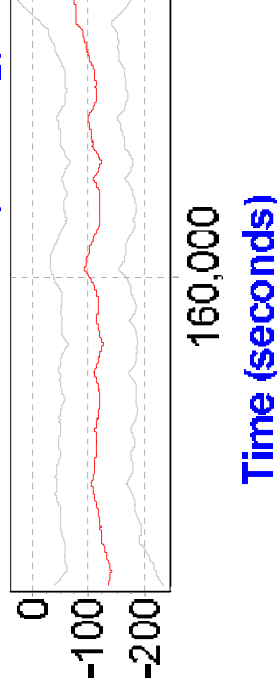
PROCESS_DIR = FORWARD ; Process direction (FORWARD/REVERSE)
BOTH_DIR = ON ; True for processing both directions
WRITE_BAD_EPOCHS = OFF ; Save bad data to .fwd/rev file (ON/OFF)
NOWRITE_HIGH = OFF 6 20.000 ; Don't write epoch with high statistics (q, stdev-m)
OUTPUT_MODE = EXTENDED ; Format for .fwd/rev file
DETAILED_SUM = ON ; Detailed Static/KAR Summary header
WRITE_SLIP_MSG = ON ; Print cycle slips to message log
SAVE_AMB = ON ; Should ambiguities be saved

```

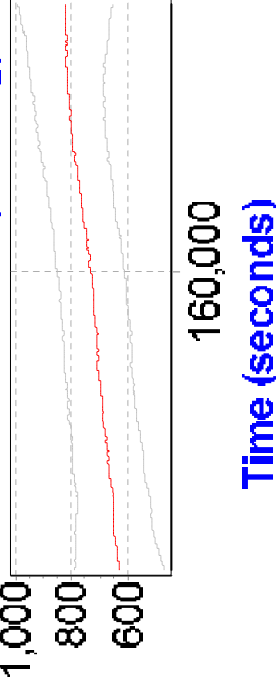
X Accelerometer Bias (micro-g)



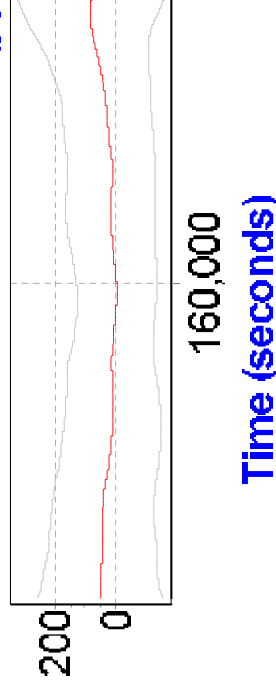
Y Accelerometer Bias (micro-g)



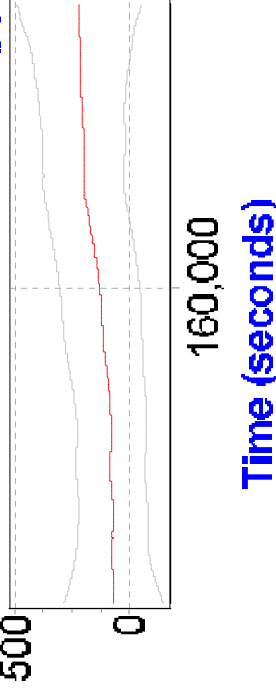
Z Accelerometer Bias (micro-g)



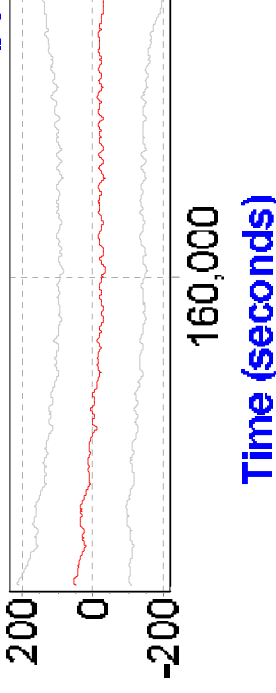
X Accelerometer Scale Factor Error (ppm)



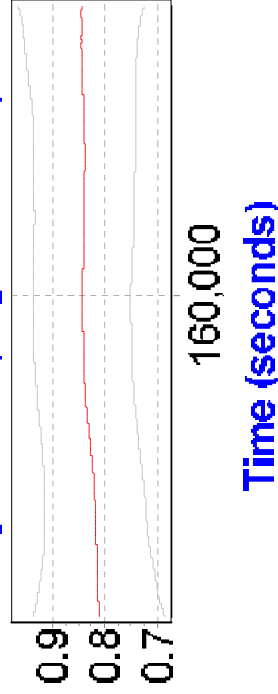
Y Accelerometer Scale Factor Error (ppm)



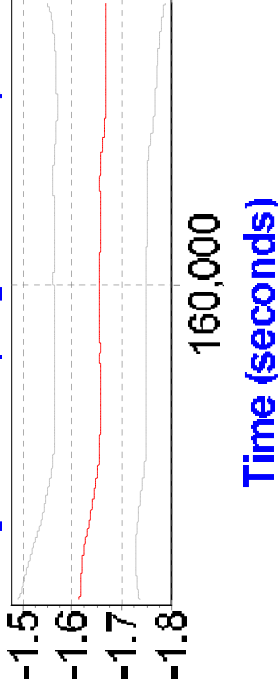
Z Accelerometer Scale Factor Error (ppm)



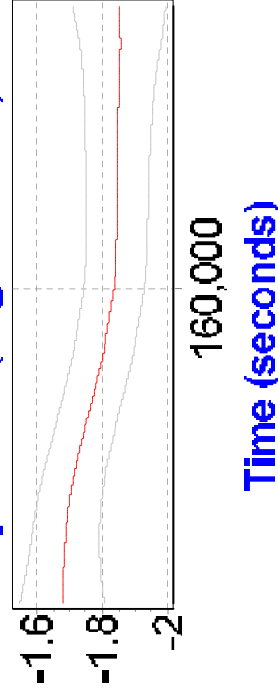
X Gyro Bias (degrees/hour)



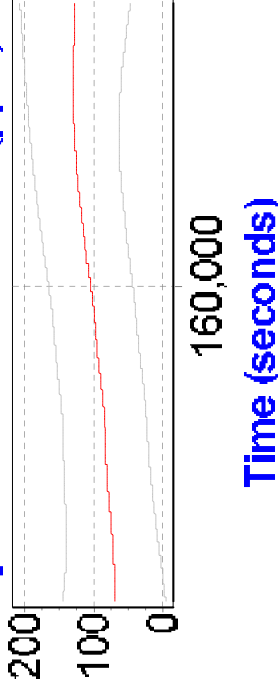
Y Gyro Bias (degrees/hour)



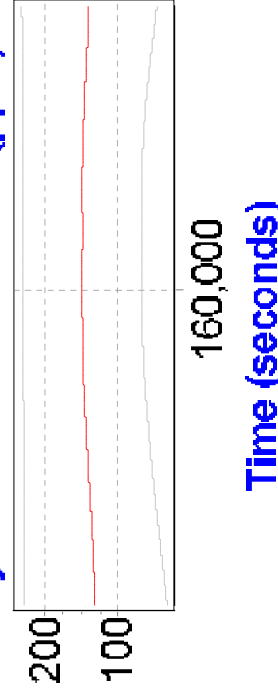
Z Gyro Bias (degrees/hour)



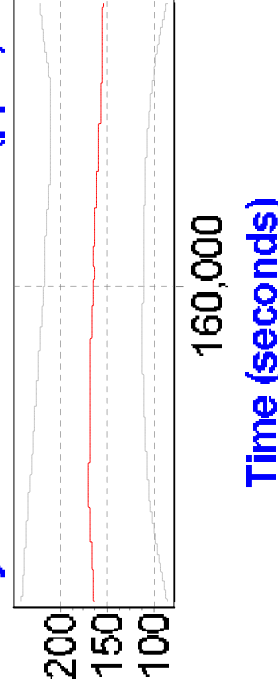
X Gyro Scale Factor Error (ppm)



Y Gyro Scale Factor Error (ppm)

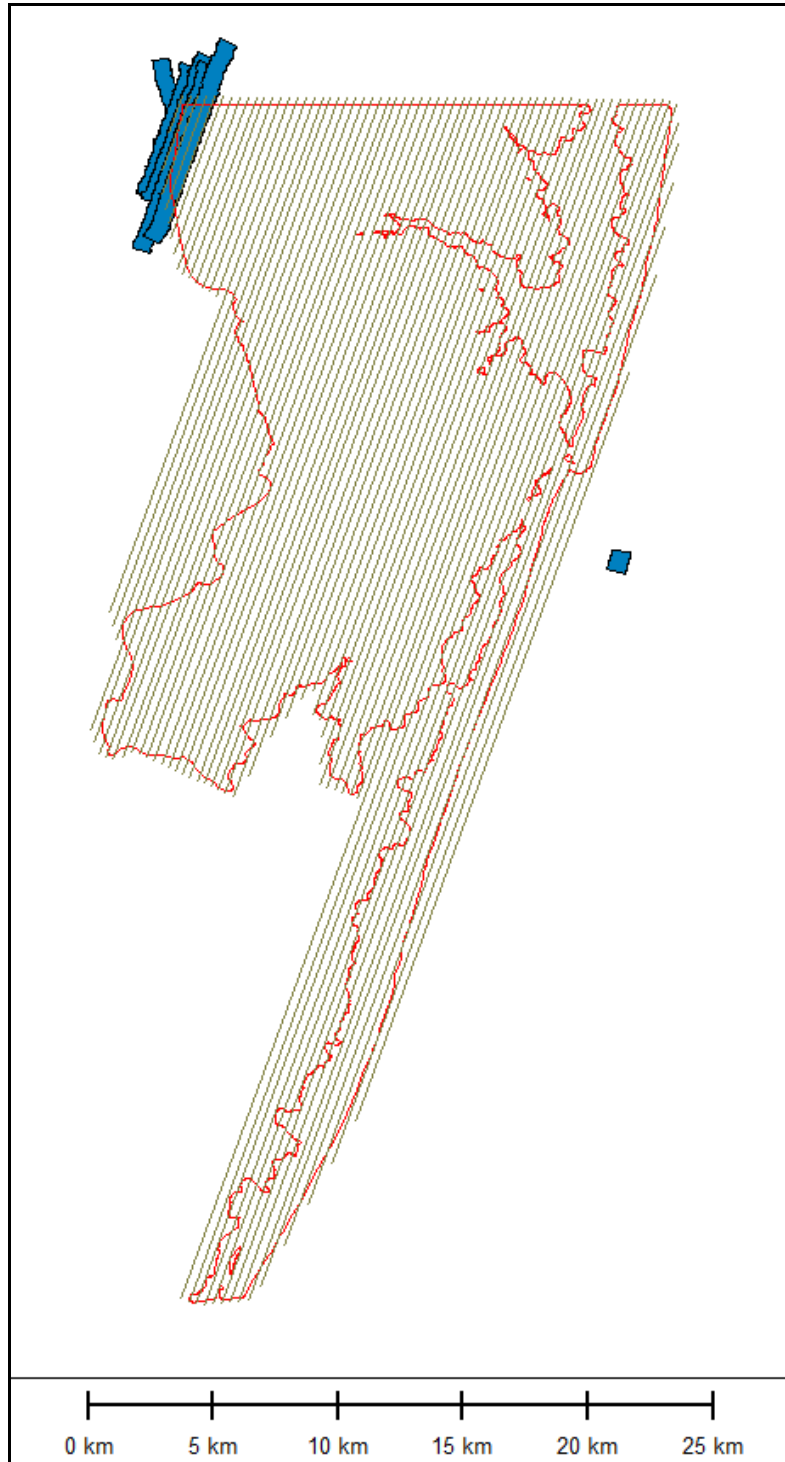


Z Gyro Scale Factor Error (ppm)



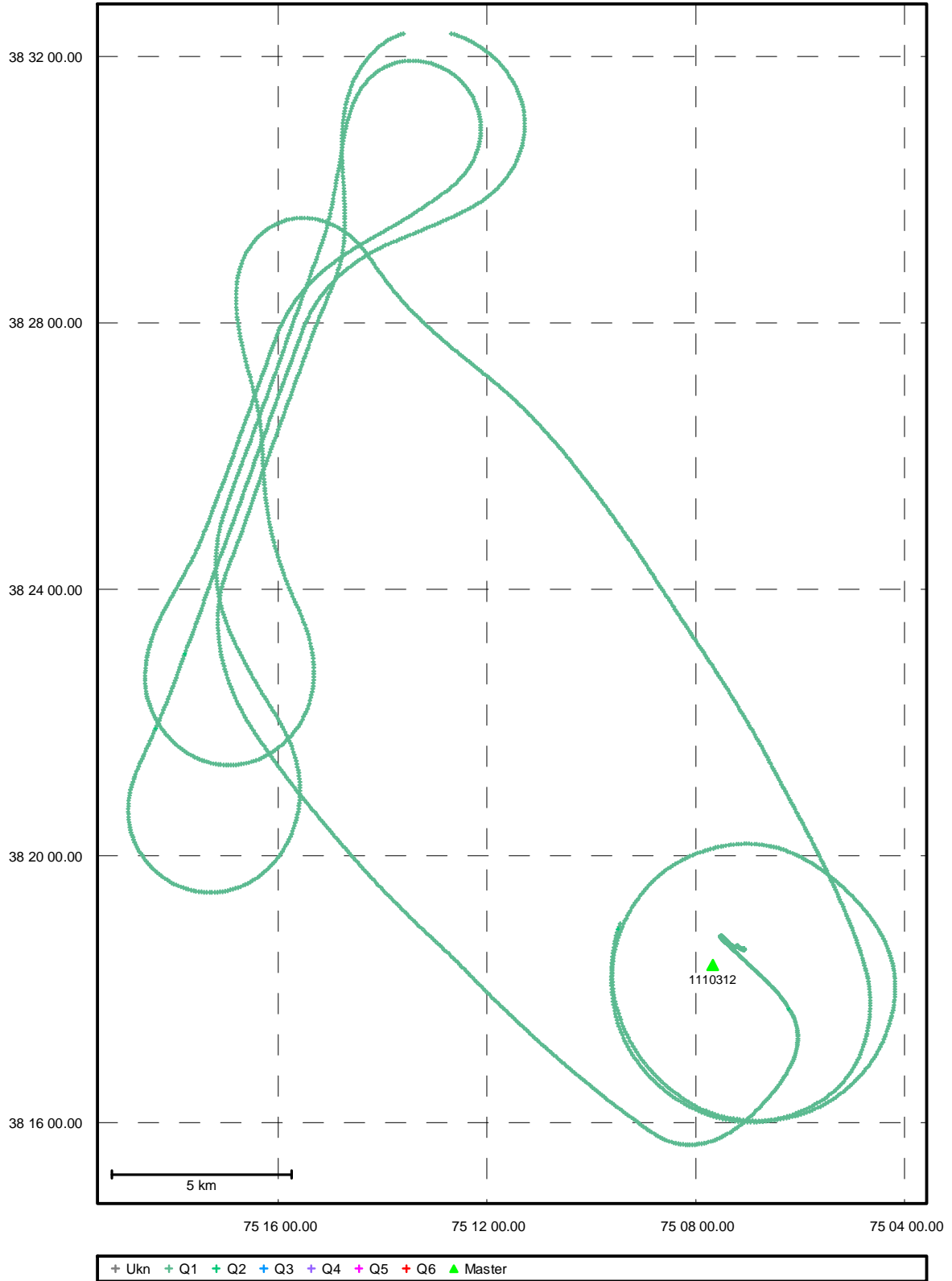
Mission: o111088a

2011 03 29



Combined - Map Run (2)

Geographic, DMS



Processing Summary Information

Program: GrafNav
Version: 7.80.2517
Project: C:\Documents and Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111088a\3_Processed\GPS\o111088a.cfg

Solution Type: Combined Fwd/Rev

Number of Epochs:

Total in GPB file:	34104
No processed position:	30706
Missing Fwd or Rev:	3
With bad C/A code:	0
With bad L1 Phase:	0

Measurement RMS Values:

L1 Phase:	0.0172 (m)
C/A Code:	0.80 (m)
L1 Doppler:	0.029 (m/s)

Fwd/Rev Separation RMS Values:

East:	0.005 (m)
North:	0.013 (m)
Height:	0.019 (m)

Fwd/Rev Sep. RMS for 25%-75% weighting (3393 occurrences):

East:	0.003 (m)
North:	0.003 (m)
Height:	0.013 (m)

Quality Number Percentages:

Q 1:	99.9 %
Q 2:	0.1 %
Q 3:	0.0 %
Q 4:	0.0 %
Q 5:	0.0 %
Q 6:	0.0 %

Position Standard Deviation Percentages:

0.00 - 0.10 m:	100.0 %
0.10 - 0.30 m:	0.0 %
0.30 - 1.00 m:	0.0 %
1.00 - 5.00 m:	0.0 %
5.00 m + over:	0.0 %

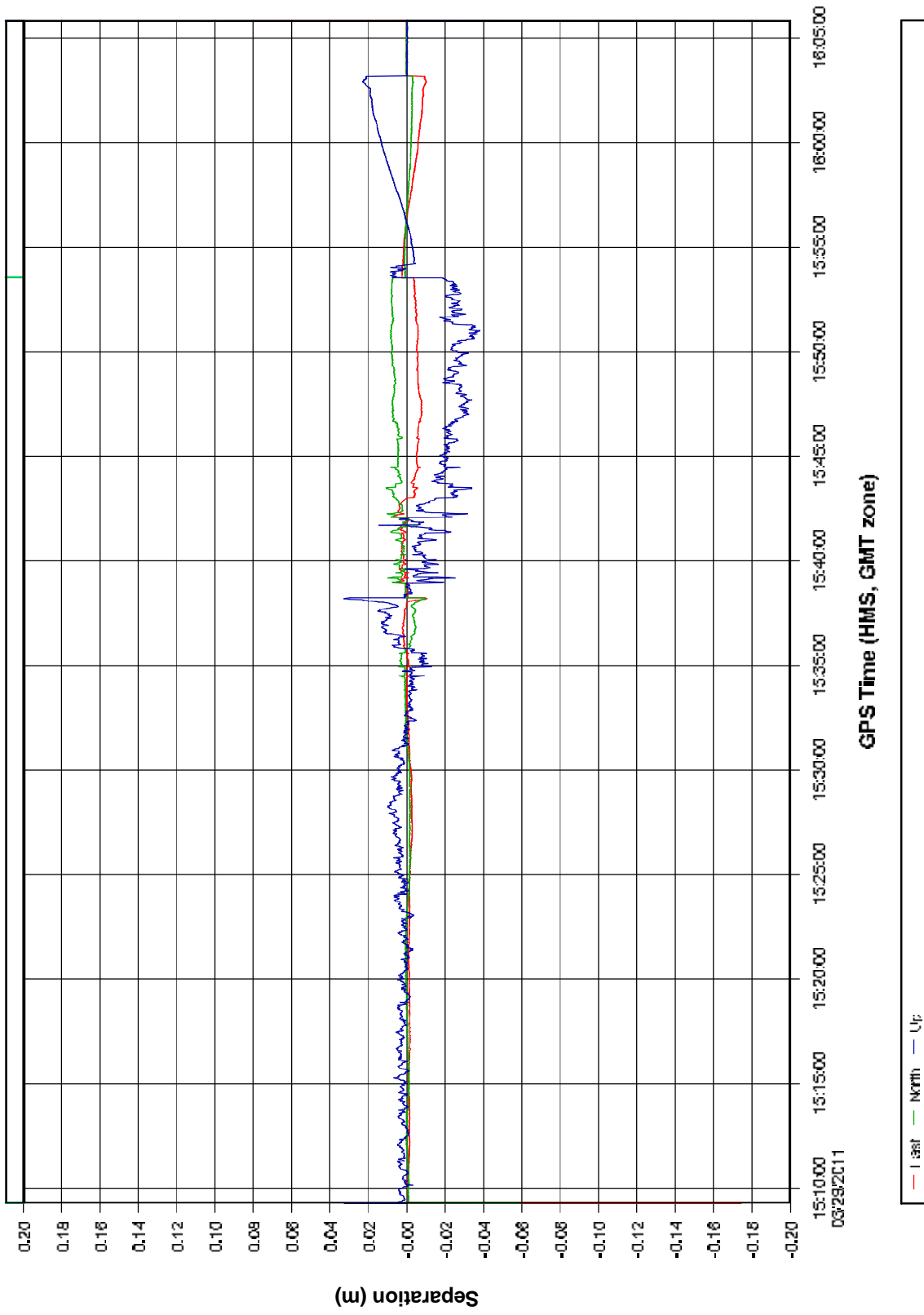
Percentages of epochs with DD_DOP over 10.00:

DOP over Tol:	0.0 %
---------------	-------

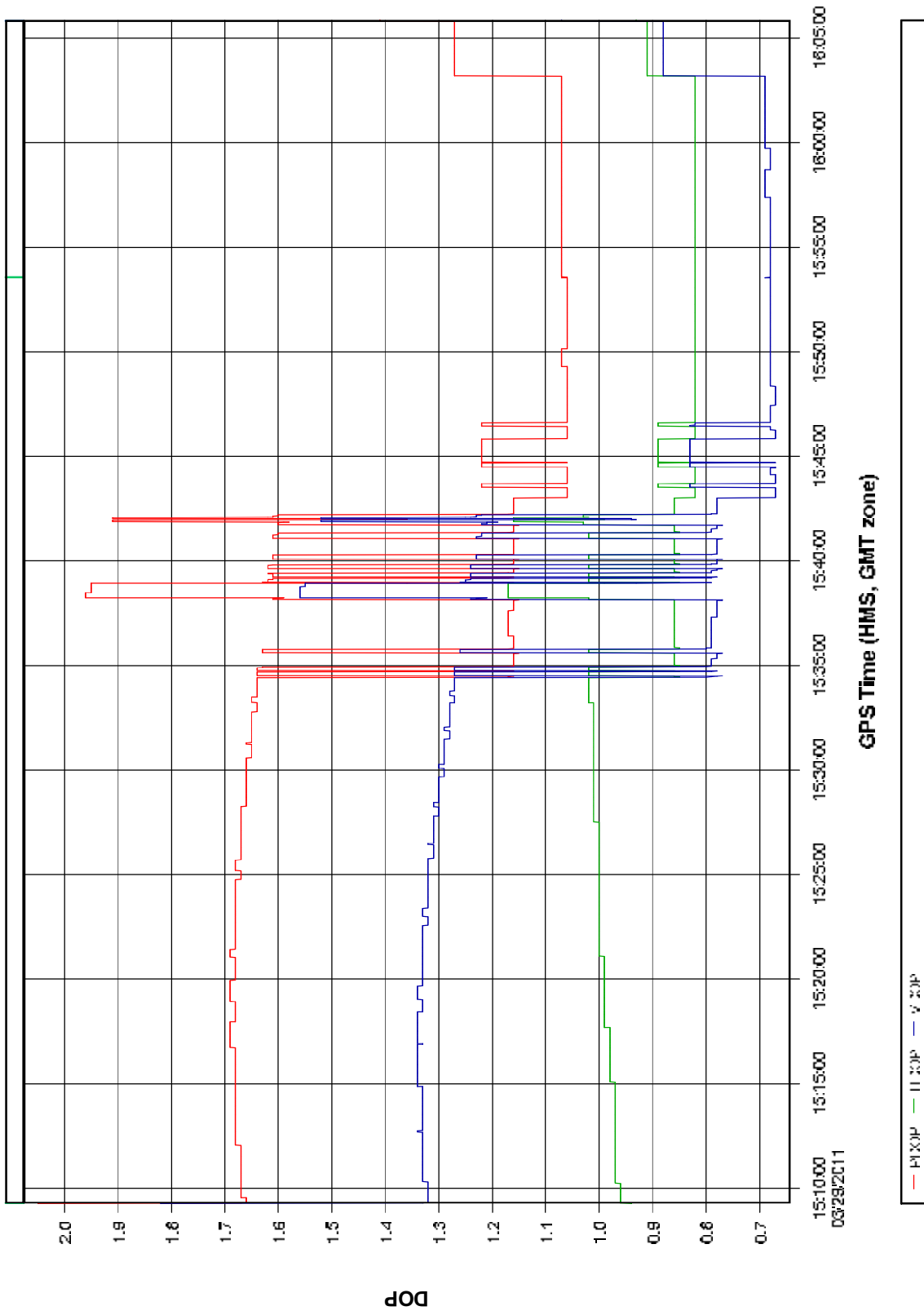
Baseline Distances:

Maximum:	27.274 (km)
Minimum:	0.692 (km)
Average:	11.541 (km)
First Epoch:	2.984 (km)
Last Epoch:	0.969 (km)

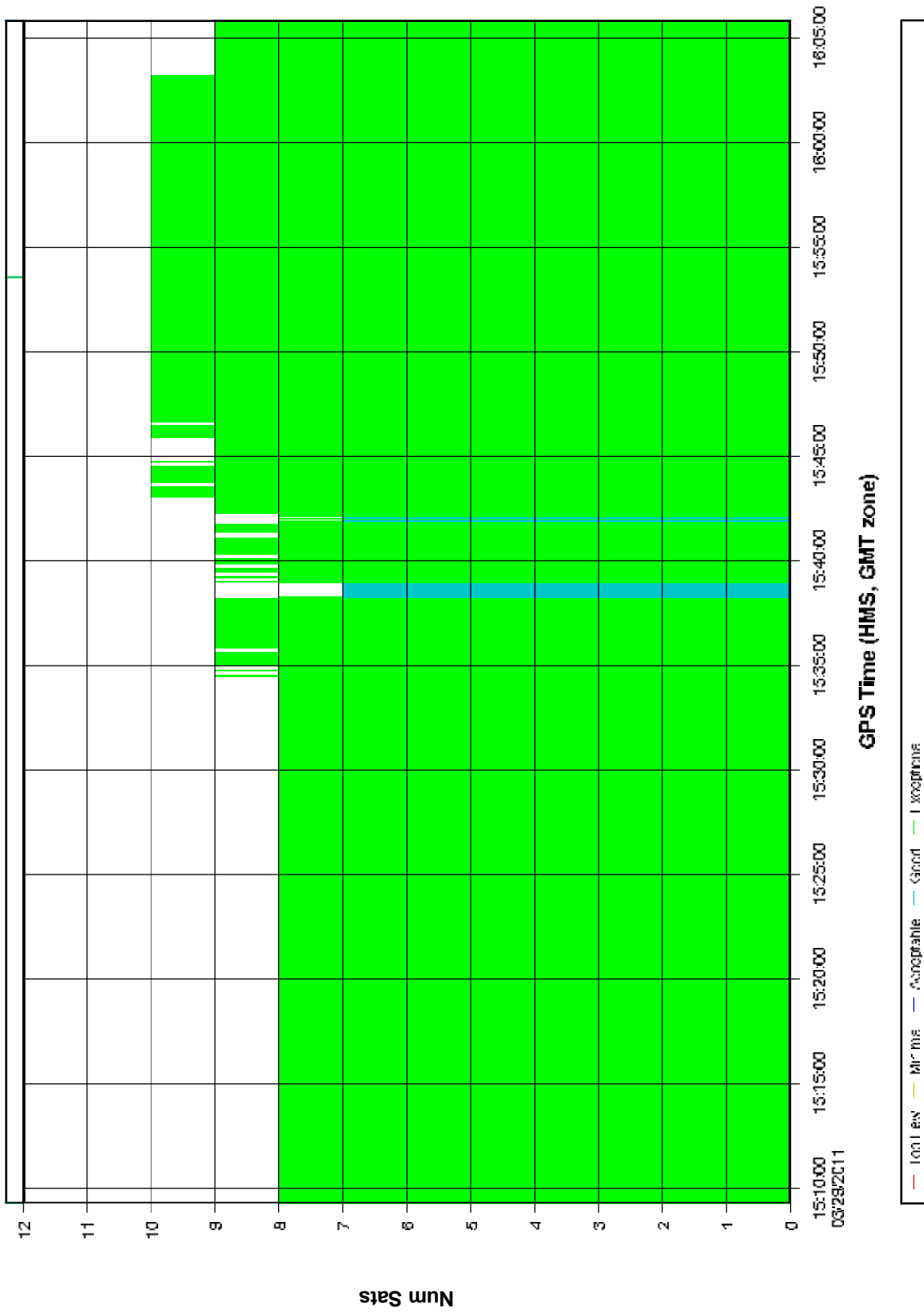
o111088a [Combined] - Forward/Reverse or Combined Separation Plot



o111088a [Combined] - PDOP, HDOP, VDOP Plots



o111088a [Combined] - Number of Satellites Bar Plot



```

                                o111088a.cfg
; PROJECT:      C:\Documents and
Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111088a\3_Processed\GPS\o111088a.cfg
;
; DATE:        March 30/11 (date/time of processing)
; TIME:        8:35:32
; CREATED BY:  GrafNav Version 7.80.2517
;
VERSION = 7.80.2517
PROCUSER = Unknown
PRODESC = Run*(3)
PROCTIME = 08:32:30 03/30/2011

; Master station # 1 information
MB_MASTER_INDEX = 0
MB_MASTER_NAME = 1110312
MB_MASTER_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111088a\1_RawData\original_PDC_files\1110312_0020_0880.gpb
MB_MASTER_POS = 38 18 22.12367 -75 07 40.46389 -33.7920
MB_MASTER_ANT = 1.526 0.001 1.492 1 _TP_SOK600 0
MB_MASTER_DISABLE = OFF

; Remote station information
REMOTE_FILE =
C:\Documents*and*Settings\adrian.camungol\Desktop\2011_103U\2_Operations\6_Missions\o111088a\3_Processed\Extract\mgps_o111088a.gpb
REMOTE_POS = 38 18 56.61679 -75 09 28.34557 898.3555
REMOTE_ANT = 0.000

; General settings
PROCESS_MODE = 105 108 113 126 ; Processing modes (GrafNav only)

DATUM = NAD83 AUTO ; Processing Datum
INPDATUM = ON NAD83 AUTO ; Input Datum (ON=Use processing datum)
ELEV_MASK = 9.0 ; Elevation mask (deg)
GRID = UTM 15 31 ; Grid info

CYCLE_TEST = BOTH ; Cycle slip test method
STATIC_SLIP_TOL = 0.40 ; slip tolerance in static mode (cycles)
USE_DOPPLER = ON OFF ; Use doppler meas. for phase, for code-only

BASE_SAT = 99 ; Base satellite (99-default)

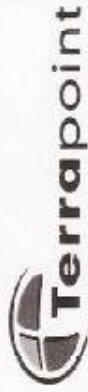
TIMERANGE = ALL 985446542.4 985449952.7 2 0 ; Processing time range
INTERVAL = 0.10 ; Processing time interval (seconds)

PROCESS_DIR = FORWARD ; Process direction (FORWARD/REVERSE)
BOTH_DIR = ON ; True for processing both directions
WRITE_BAD_EPOCHS = OFF ; Save bad data to .fwd/rev file (ON/OFF)
NOWRITE_HIGH = OFF 6 20.000 ; Don't write epoch with high statistics (q, stdev-m)
OUTPUT_MODE = EXTENDED ; Format for .fwd/rev file
DETAILED_SUM = ON ; Detailed Static/KAR Summary header
WRITE_SLIP_MSG = ON ; Print cycle slips to message log

```

Project # 11103u Session 011088

Flight Log



Date	11/03/08	Julian Day	088
Project	FEMA Virginia	Aircraft	Newline
Staging	Ocean City	Call Sign	1008
Survey Block	Worcester	Pilot	Face Baker
Lines Complete	1-4	Operator	Alcatraz
Mission Objective		Observer	NA

ALMIS/OpTech	0
System #	1
Laser Scanner	
Camera/Lens SN	NA
Shutter Speed	NA
Photo Freq.	NA
IMU	
GPS Rx	
Data Drive	

Additional Notes:
 Had to restart in air, no ranges (unstable voltage)
 Outside Temp @ TO: 8
 Outside Pressure @ TO: 3020
 Outside Temp @ LA:
 Outside Pressure @ LA:

Aircraft Block Time	<input type="checkbox"/> Times confirmed with pilot		
Engine On (Tobos)	Ramp Out	Takeoff	
10:20		10:48	
Engine Off (Hooks)	Ramp In	Landing	
12:07		11:55	
Total hrs (Habib)	Total hrs	Total hrs	
1.8		1.2	

Flying Height (AGL)	Mission Plan	
950	Scan Angle (Optech)	
Ground Speed	22°	
150	Minor Scan Rate	
First/Last/Alternating Return	40	
	Laser Pulse Rate	

Time	GPS	Start	End
Pre Mission		10:20	10:43
KAR Base		10:31	10:41
KAR Base		11:56	12:06
Post Mission		11:56	12:06

Flight Plan Line #	LIDAR File Name	Flight Direction	GPS / UTC Time		Flight Altitude		Photo Events / Comments Please periodically recvd. Cabin Temp Output (Watts):
			Start	End	Time	NM to End	
1		N	11:23	11:23			Missed approach
2		S	11:28	11:29			
3		N	11:33	11:34			
4		S	11:39	11:41			
			11:45	11:47			



GPS Base Log Sheet

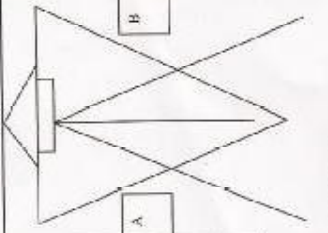
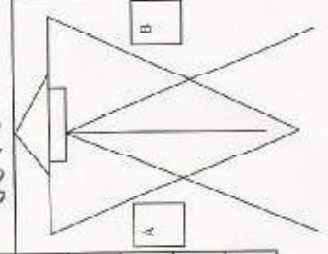
Station ID:	Base 12	Project #:	11103U	Missions:	6/11088
-------------	---------	------------	--------	-----------	---------

Project Name:	FEMA Virginia	Calendar Date:	Mar. 29/11	Julian Day	088
Approx. Coordinates	WGS 84	N	38 18 22.12	W	75 07 40.45
Description of Mark (Take Photos)					
Monument is: <input type="checkbox"/> Flush with ground <input checked="" type="checkbox"/> Above ground 25 cm <input type="checkbox"/> Below ground _____ cm					
Location & Access					

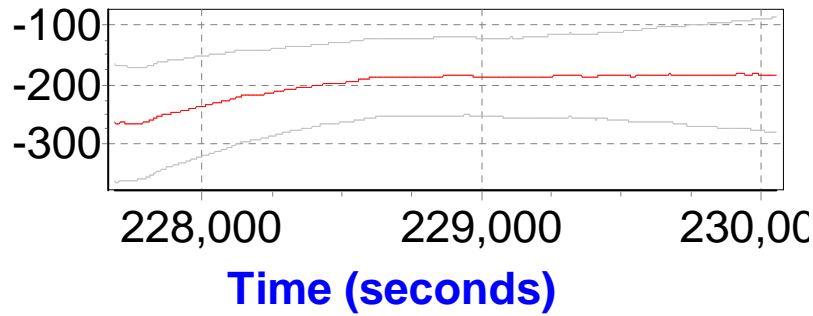
Observations & Additional Notes

GPS Observation - MAIN					
Rx Make / Model	Serial #				
GSR 2600	0020				
Ant Make / Model	Serial #				
SK 600	0010				
Operator: McAtt W					
Session Time (GPS)	Start	End			
	14:08	16:22			
Slant HI Before:	A: 1.492	B: 1.492			
Slant HI After:	A: 1.492	B: 1.492			
Correction					
Phase Center					
Data File Name	00200880.pdc				

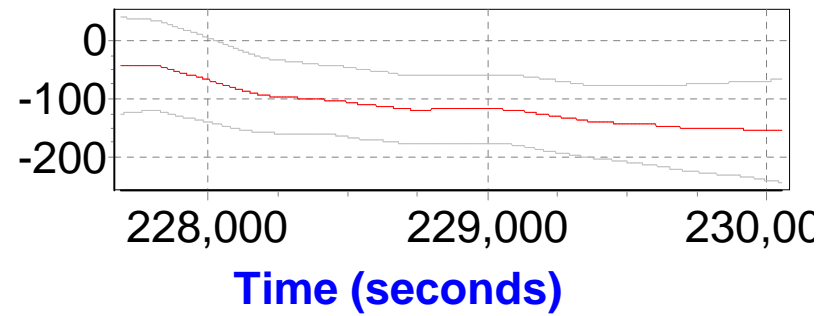
GPS Observation - Back-Up					
Rx Make / Model	Serial #				
Ant Make / Model	Serial #				
Operator					
Session Time (GPS)	Start	End			
Slant HI Before:	A:	B:			
Slant HI After:	A:	B:			
Correction					
Phase Center					
Data File Name					



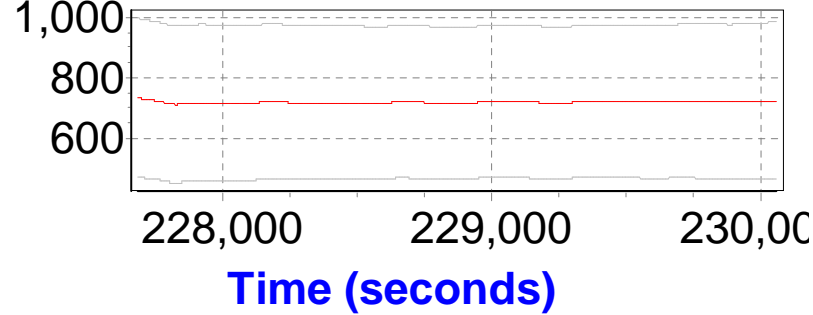
X Accelerometer Bias (micro-g)



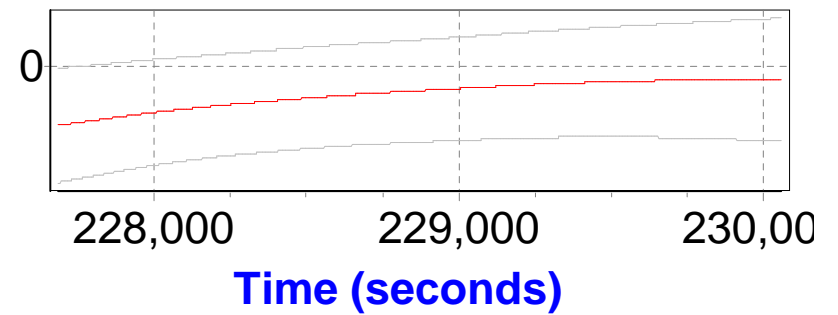
Y Accelerometer Bias (micro-g)



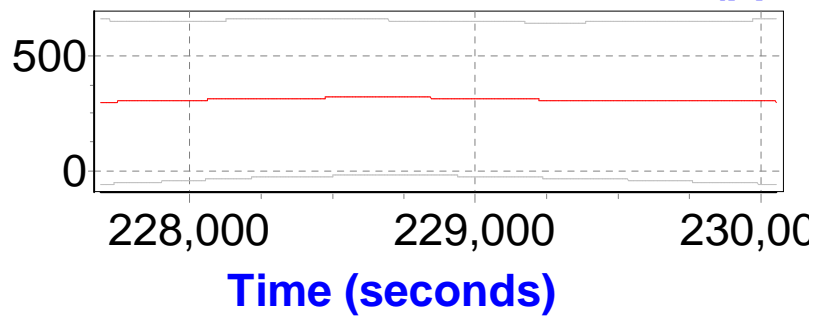
Z Accelerometer Bias (micro-g)



Accelerometer Scale Factor Error (ppr)



Accelerometer Scale Factor Error (ppr)



Accelerometer Scale Factor Error (ppr)

