Continuing Professional Development

Review of
Geodetic Solutions
On-line Training
September 2005

Disclosure

- The purpose of this presentation is exchange of information to assist members in their professional development
- No endorsement is made by Cain & Barnes, individually, or, as current or past executives of APSG
- No sales commissions or other rewards
- In keeping with APSG, this is not a marketing presentation

Outline

- The impetus is the need for better self-regulation within the survey industry
- Geodetic Solutions formed from Quest, which grew out of University of Newcastle from Paul Cross students
- Lead by Martin Rayson and Simon Corbett
- Development version of Online Training launched May 05, based on many years of experience

Applications

- Relevant to general survey industry as a CPD tool
- Oil and Gas Industry audience should be managers, supervisors and field staff responsible for geospatial data acquisition, processing, analysis and reporting
- Organizations should include; oil companies, main contractors, survey companies, consultants and experts associated with geospatial data
- 35 training modules allow customization courses for seismic navigation, rig positioning, hydrographic, ROV operations, site surveys, marine engineering support etc.

Features and Benefits

- Modules available covering a range of subjects
- In this review, two subjects in multiple modules
  - Geodesy
  - Navigation and Positioning
- Two phases
  - Training
  - Examination

Feature and Benefits

- Distance learning to save course costs and reduce logistics
- Allows learning and examination at own pace
- Supervisor is assigned for class
- Customized courses can be developed at many levels
- Potential to host other training subjects, e.g. site survey equipment
- On-line product has accuracy, brevity and clarity

Sample Topics covered

35 training modules are available, for example

- **Basic Geodesy**
- **Co-ordinate Reference Systems**
- **Datum**
- **Projections**
- **Errors**
- **Least Squares Adjustments**
- **Basic Statistics**
- **Test Statistics**
- **Quality**
- **GPS**
- **DGPS QC**

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Start up: Privacy

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Forum

GEODETIC SOLUTIONS

Welcome! (login | register) » Geodetic Solutions Forum » Geodetic Issues » Datum Issues » Three Parameter Transformation

members | search | help

Pages: << prev 1 next >>

reply new topic new poll

Three Parameter Transformation [View Printable]

MaryT
Member

EMAIL PM QUOTE

What is the difference in accuracy between a three parameter shift and a seven parameter shift

Group: Members
Posts: 1
Joined: May 19, 2005

Posted May 19, 2005, 8:58 am

mrayson
Member

EMAIL PM QUOTE

Mary,

The difference is as follows: When a three parameter transformation is created it only uses the three translation parameters. As such it absorbs the three rotation and one scale parameter into the translation parameters. Therefore, it is enevitable that there will be some degradation of precision when the three parameter transformation is performed. However, the quality of the transformation will also depend upon the transformation model used and the care taken in defining the translation parameters.

Take the parameters issued by the DMA as an example. Within their WGS84 document they publish how many points were used to define the three parameter shift for the country of use and also the expected accuracy on the position

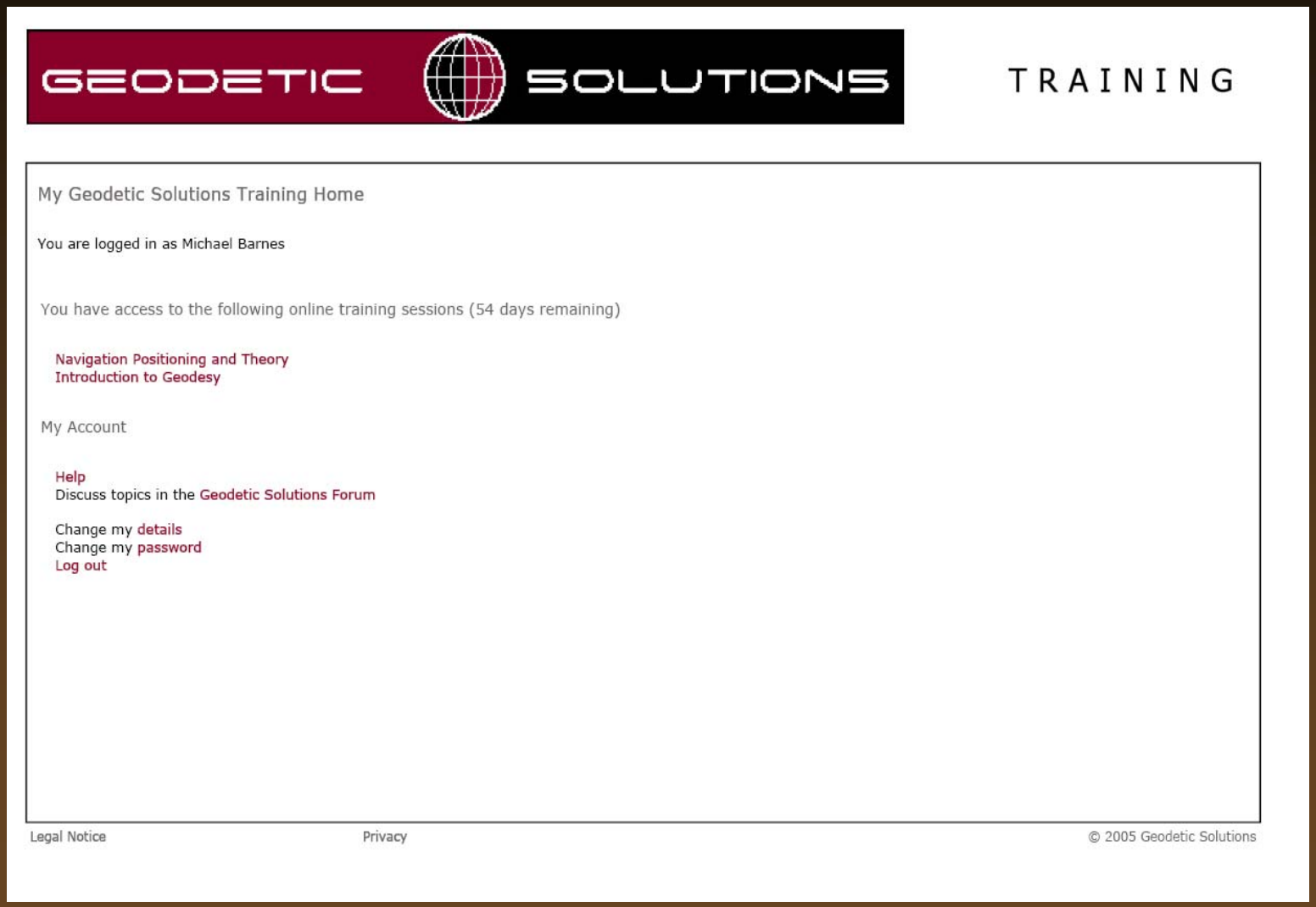
Group: Members
Posts: 2
Joined: May 19, 2005

Posted May 19, 2005, 9:03 am

Pages: << prev 1 next >>

reply new topic new poll

Training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My Geodetic Solutions Training Home
You are logged in as Michael Barnes
You have access to the following online training sessions (54 days remaining)
Navigation Positioning and Theory
Introduction to Geodesy
My Account
Help
Discuss topics in the Geodetic Solutions Forum
Change my details
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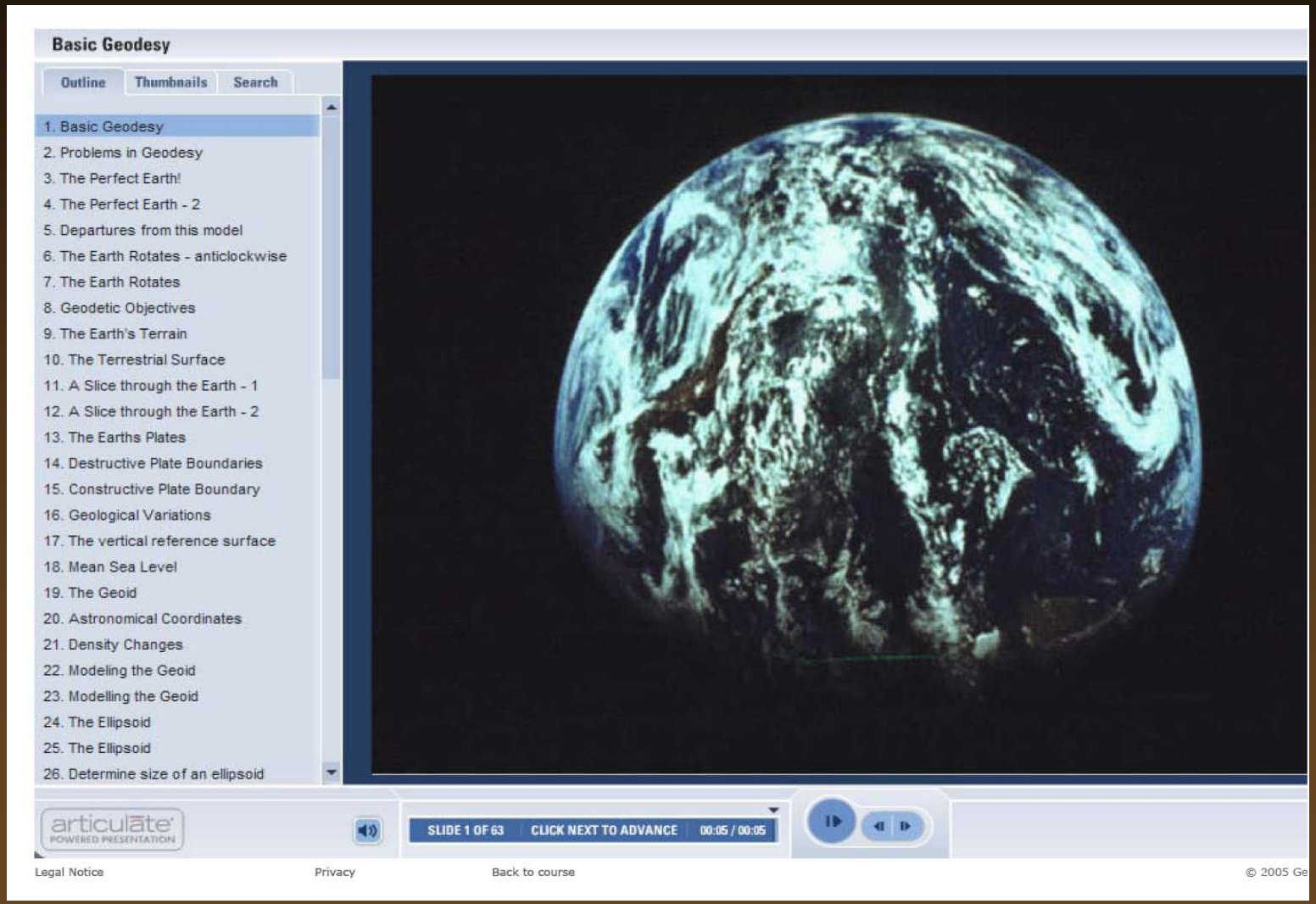
Tutorial


Basic Geodesy
Outline
Thumbnails
Search
1. Basic Geodesy
2. Problems in Geodesy
3. The Perfect Earth!
4. The Perfect Earth - 2
5. Departures from this model
6. The Earth Rotates - anticlockwise
7. The Earth Rotates
8. Geodetic Objectives
9. The Earth's Terrain
10. The Terrestrial Surface
11. A Slice through the Earth - 1
12. A Slice through the Earth - 2
13. The Earths Plates
14. Destructive Plate Boundaries
15. Constructive Plate Boundary
16. Geological Variations
17. The vertical reference surface
18. Mean Sea Level
19. The Geoid
20. Astronomical Coordinates
21. Density Changes
22. Modeling the Geoid
23. Modelling the Geoid
24. The Ellipsoid
25. The Ellipsoid
26. Determine size of an ellipsoid
articulate
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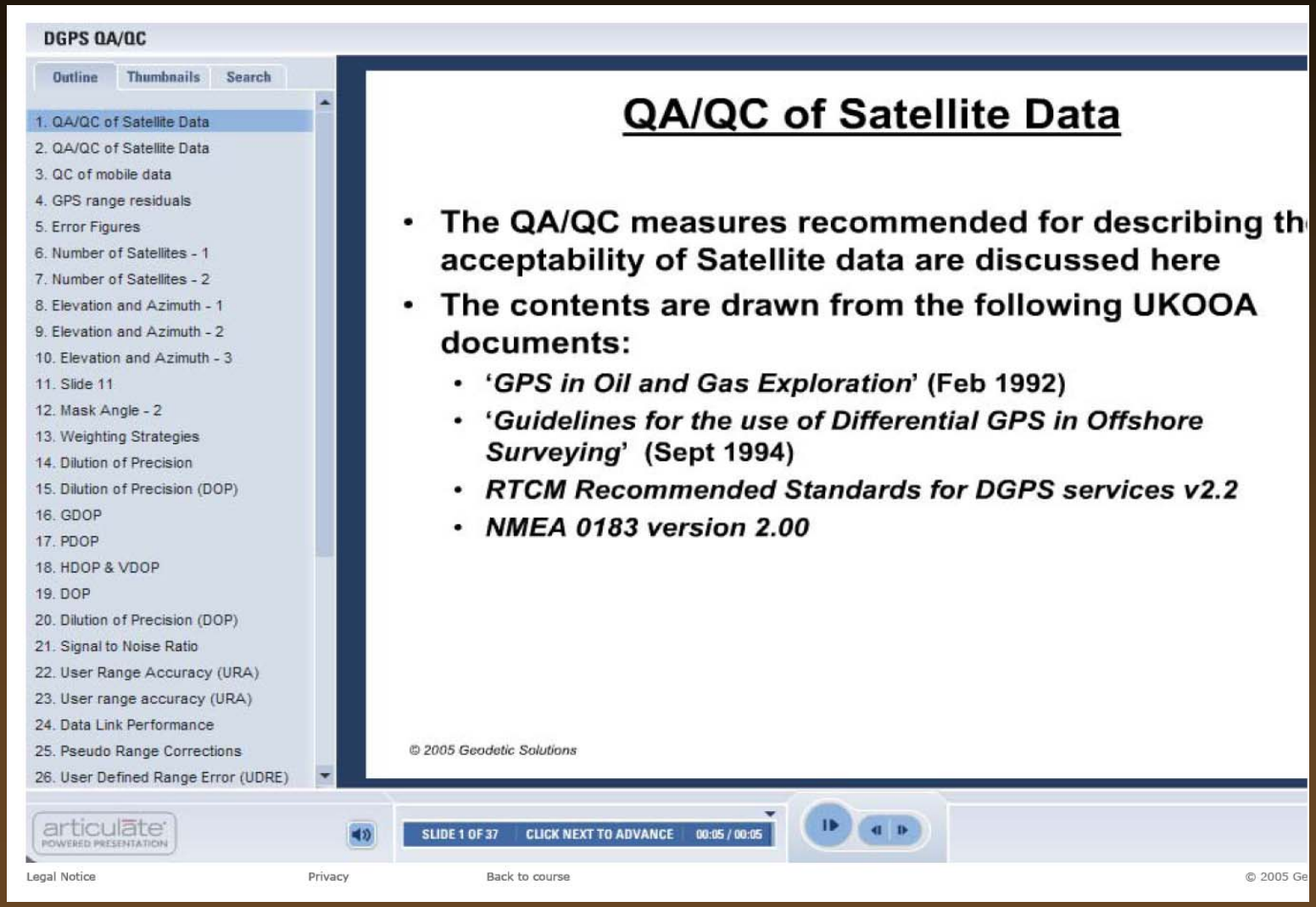
DGPS QA/QC
Outline
Thumbnails
Search
1. QA/QC of Satellite Data
2. QA/QC of Satellite Data
3. QC of mobile data
4. GPS range residuals
5. Error Figures
6. Number of Satellites - 1
7. Number of Satellites - 2
8. Elevation and Azimuth - 1
9. Elevation and Azimuth - 2
10. Elevation and Azimuth - 3
11. Slide 11
12. Mask Angle - 2
13. Weighting Strategies
14. Dilution of Precision
15. Dilution of Precision (DOP)
16. GDOP
17. PDOP
18. HDOP & VDOP
19. DOP
20. Dilution of Precision (DOP)
21. Signal to Noise Ratio
22. User Range Accuracy (URA)
23. User range accuracy (URA)
24. Data Link Performance
25. Pseudo Range Corrections
26. User Defined Range Error (UDRE)
QA/QC of Satellite Data
The QA/QC measures recommended for describing th
acceptability of Satellite data are discussed here
The contents are drawn from the following UKOOA documents:
'GPS in Oil and Gas Exploration' (Feb 1992)
'Guidelines for the use of Differential GPS in Offshore Surveying' (Sept 1994)
RTCM Recommended Standards for DGPS services v2.2
NMEA 0183 version 2.00
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DGPS QA/QC

Outline | Thumbnails | Search

13. Weighting Strategies
14. Dilution of Precision
15. Dilution of Precision (DOP)
16. GDOP
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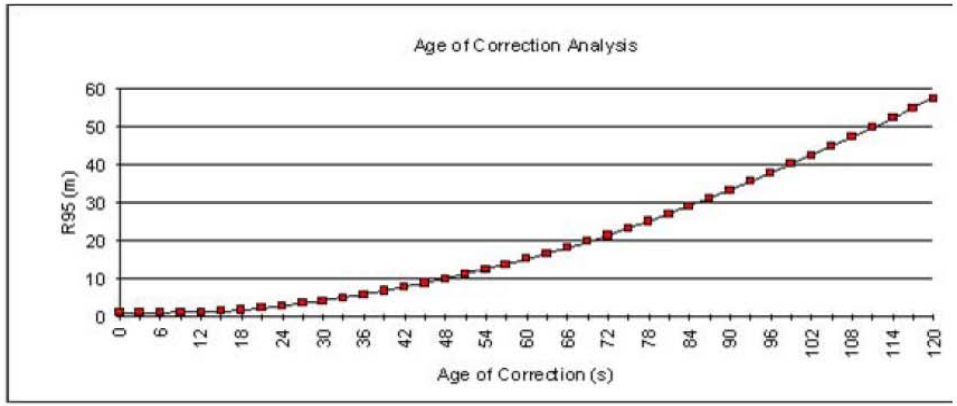
23. User range accuracy (URA)
24. Data Link Performance
25. Pseudo Range Corrections
26. User Defined Range Error (UDRE)
27. Rate of Change (ROC)
28. Timing Considerations
29. Age of Correction
30. Age of Correction Analysis
31. Differential Latency
32. Issue of Date of Ephemerides
33. Height Aiding
34. Height Aiding Errors
35. Typical DGPS QC
36. DoD / DoT Joint Task Force
37. Finished!

Age of Correction Analysis

- Plot shows the R95 values for horizontal DGPS errors



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DGPS QA/QC

Outline | Thumbnails | Search

13. Weighting Strategies
14. Dilution of Precision
15. Dilution of Precision (DOP)
16. GDOP
17. PDOP
18. HDOP & VDOP
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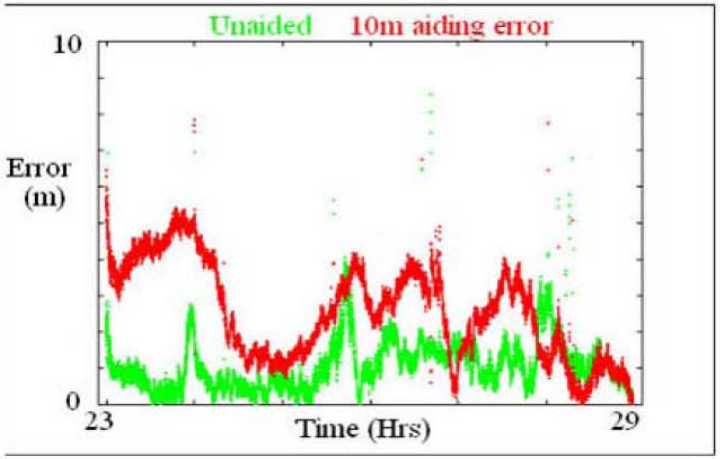
37. Finished!

Height Aiding Errors

- If height is wrong, 2D errors will result at approx 2:1 ratio



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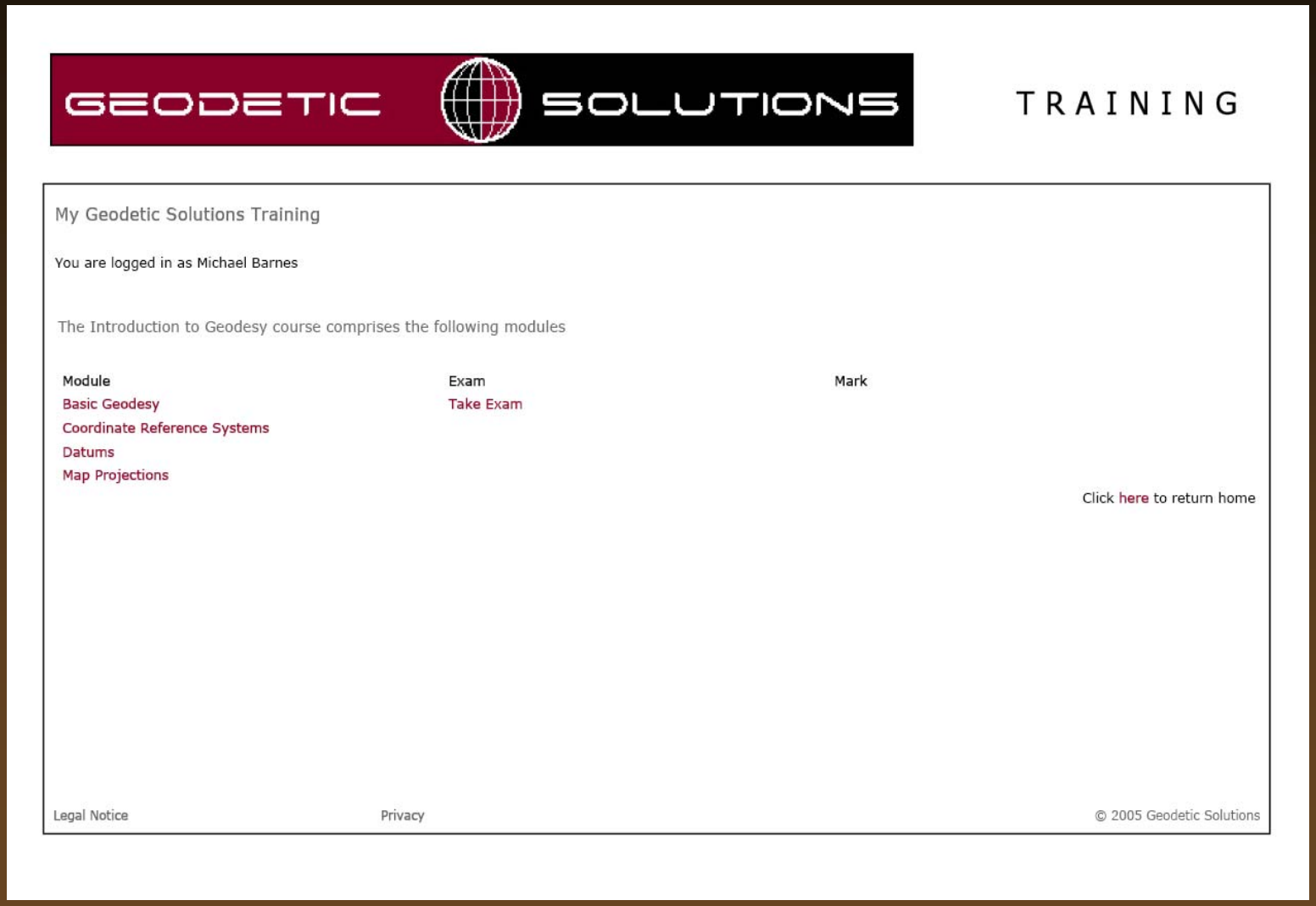
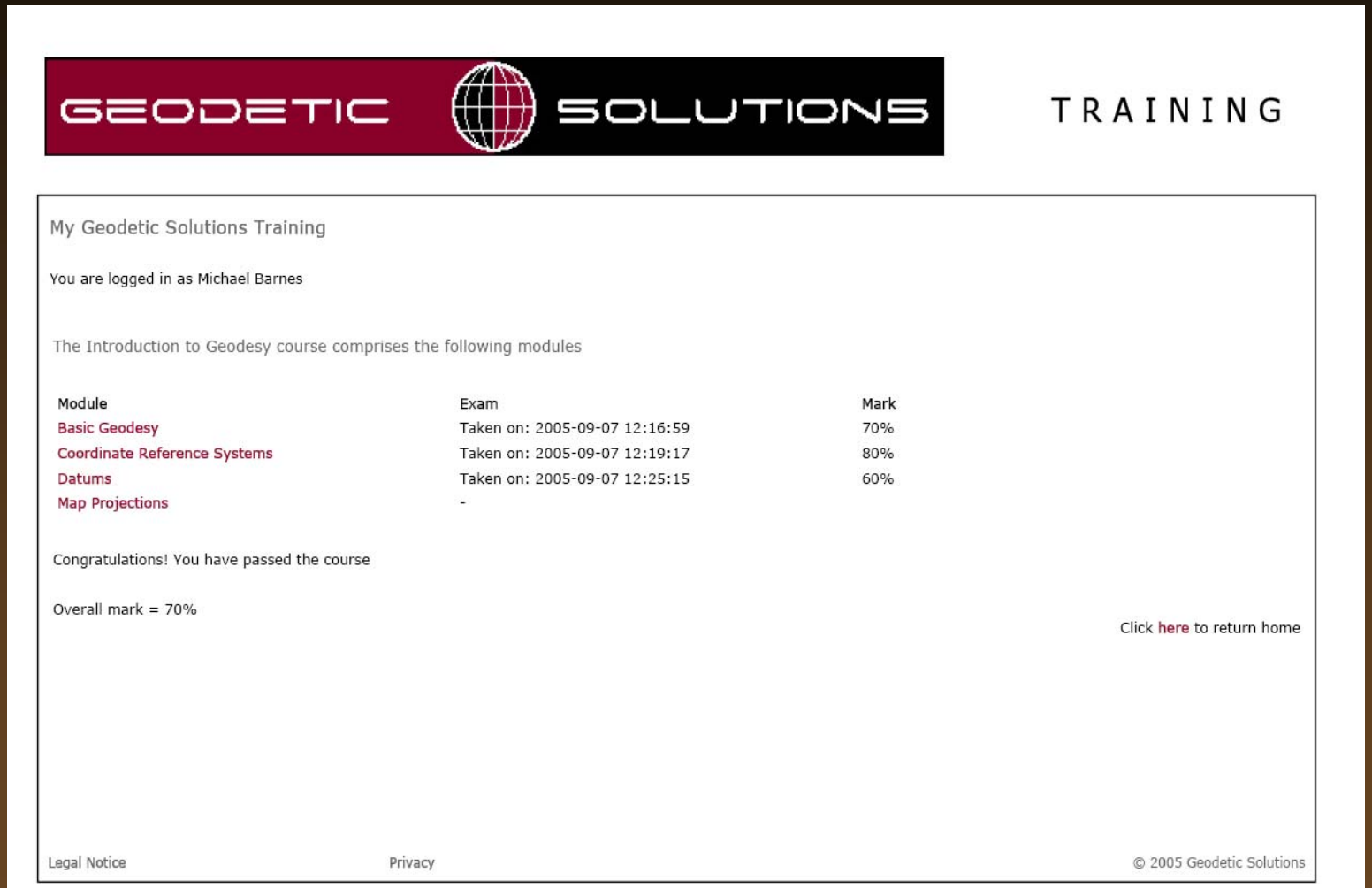
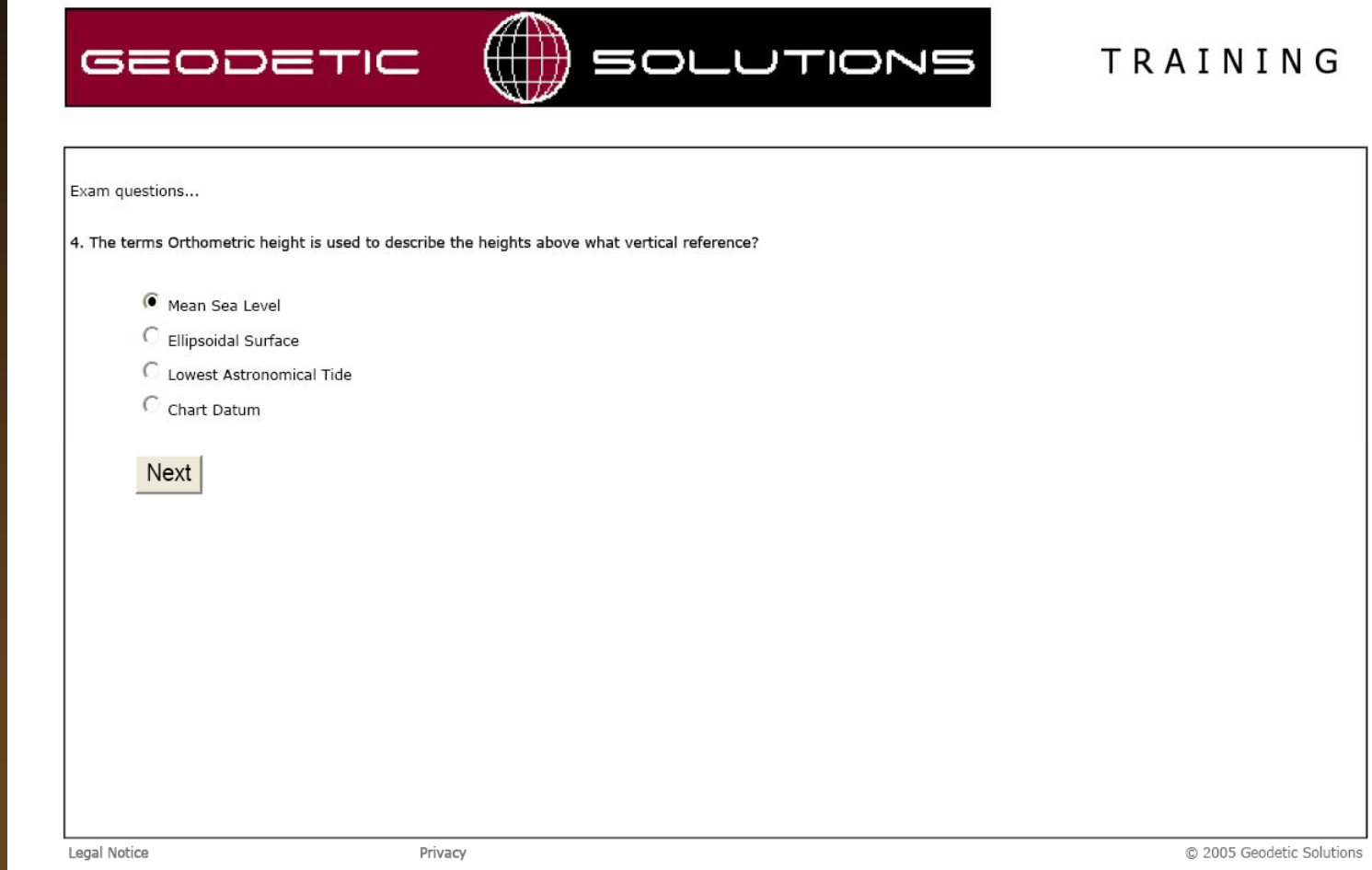
Examinations in sequence



The process 3-7 minutes each



Exam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TRAINING
Exam questions...
4. The terms Orthometric height is used to describe the heights above what vertical reference?
Mean Sea Level
Ellipsoidal Surface
Lowest Astronomical Tide
Chart Datum
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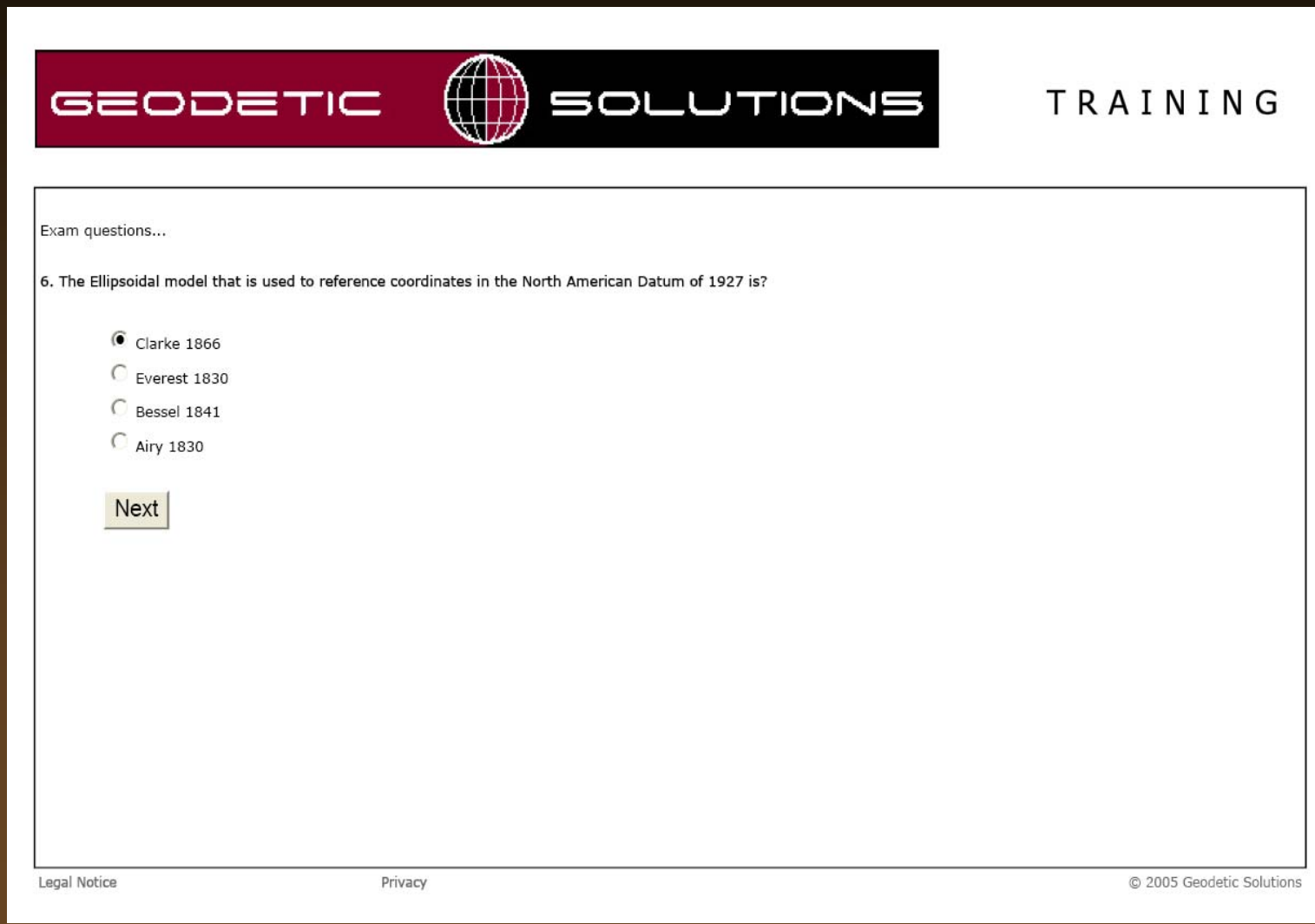
Exam


GEODETIC SOLUTIONS
TRAINING
Exam questions...
6. The Ellipsoidal model that is used to reference coordinates in the North American Datum of 1927 is?
Clarke 1866
Everest 1830
Bessel 1841
Airy 1830
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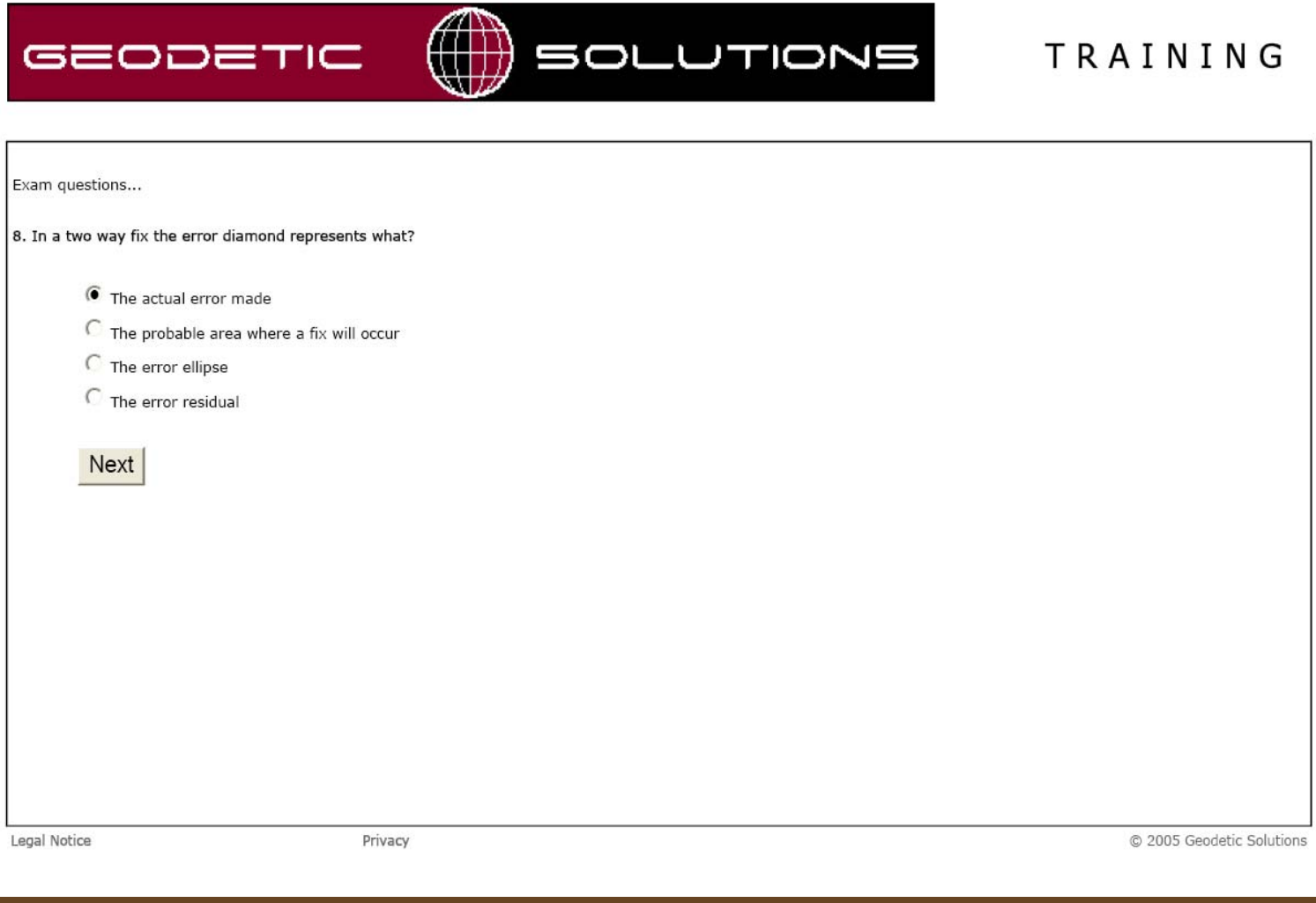
Exam


GEODETIC SOLUTIONS
TRAINING
Exam questions...
8. In a two way fix the error diamond represents what?
The actual error made
The probable area where a fix will occur
The error ellipse
The error residual
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Exam

TRAINING

Exam questions...

2. What is recommended maximum distance at which a DGPS reference station can be comfortably used in a position fix?

- (•) 20
- ( ) 100
- ( ) 500
- ( ) 1200

Next

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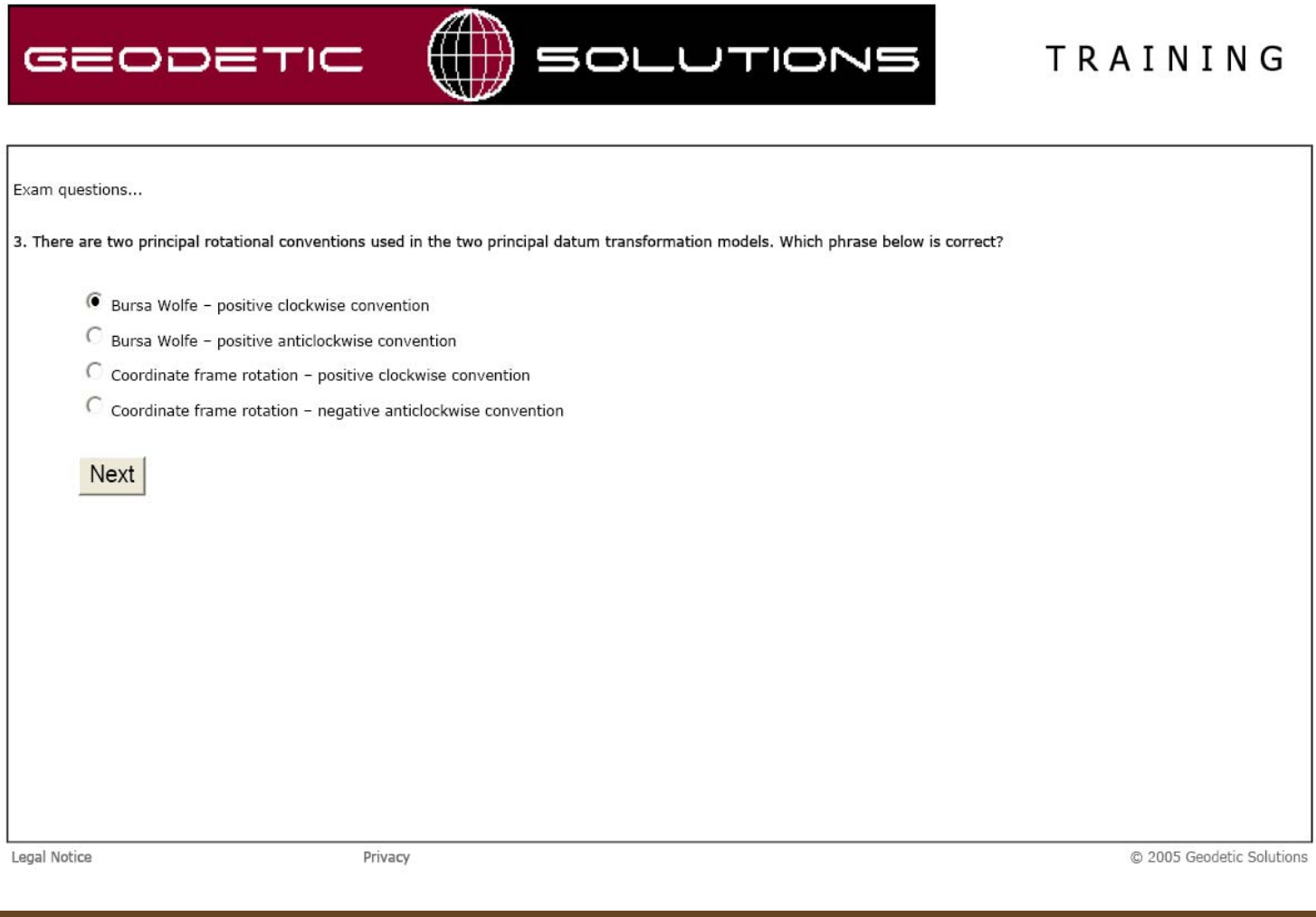
Exam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Exam questions...
3. There are two principal rotational conventions used in the two principal datum transformation models. Which phrase below is correct?
Bursa Wolfe – positive clockwise convention
Bursa Wolfe – positive anticlockwise convention
Coordinate frame rotation – positive clockwise convention
Coordinate frame rotation – negative anticlockwise convention
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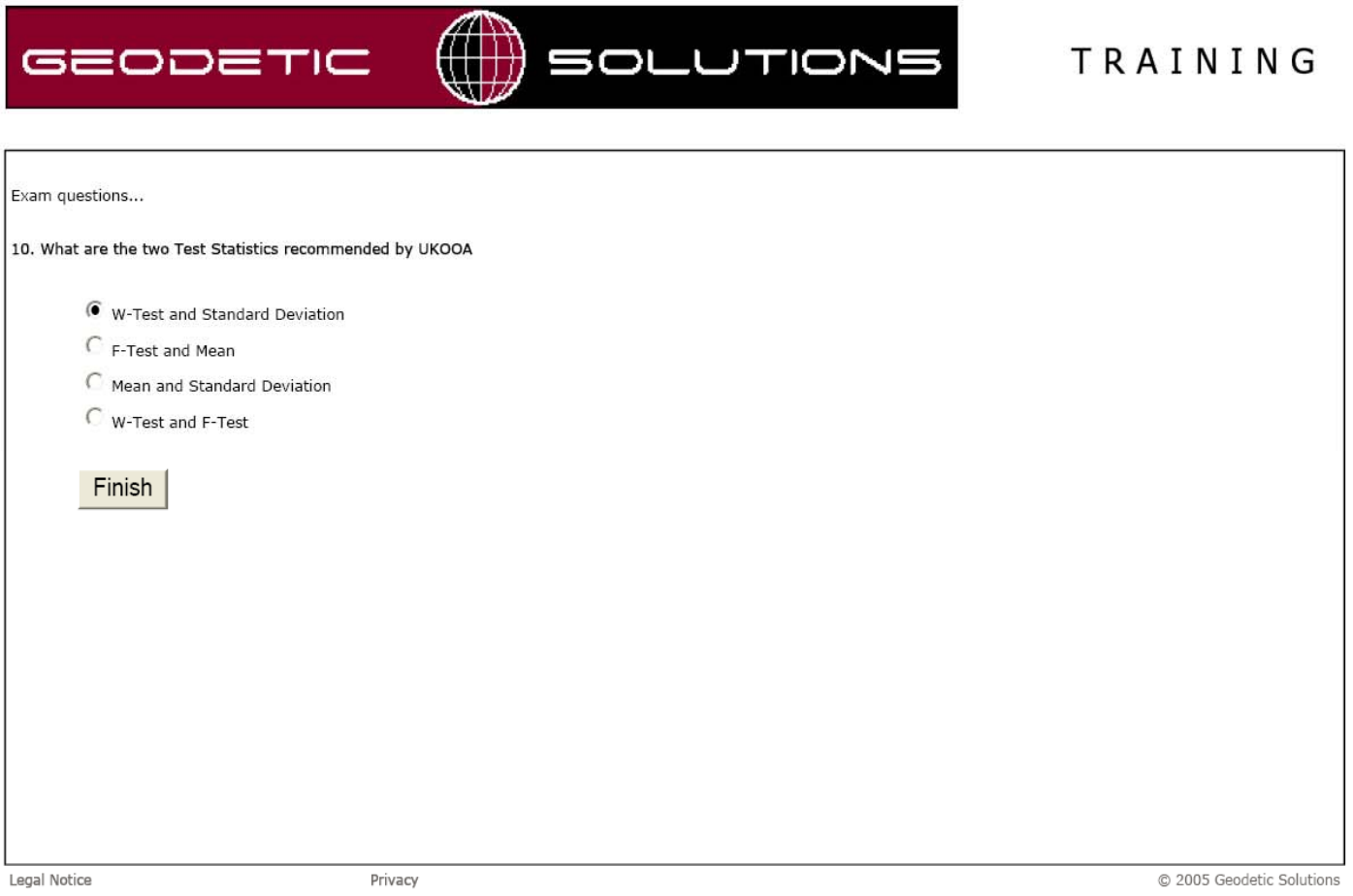
Exam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TRAINING
Exam questions...
10. What are the two Test Statistics recommended by UKOOA
W-Test and Standard Deviation
F-Test and Mean
Mean and Standard Deviation
W-Test and F-Test
Finish
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Exam

GEODETIC SOLUTIONS
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Exam questions...
2. In the covariance matrix of the observations what term is used to describe the diagonal elements of the matrix?
Diagonals
Variances
Covariances
Squares
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Barnes *a priori* exam results

TRAINING

My Geodetic Solutions Training

You are logged in as Michael Barnes

The Navigation Positioning and Theory course comprises the following modules

Module	Exam	Mark
Basic Geodesy	Taken on: 2005-09-07 12:29:25	60%
Coordinate Reference Systems	Taken on: 2005-09-07 12:31:36	80%
Datums	Taken on: 2005-09-07 12:34:12	80%
Map Projections	-	
Errors	Taken on: 2005-09-07 12:37:35	80%
General Approach to Position Fixing	-	
Least Squares Adjustment	Taken on: 2005-09-07 12:40:36	60%
Basic Statistics	Taken on: 2005-09-07 12:59:28	70%
Test Statistics	Taken on: 2005-09-07 13:08:17	80%
Quality	Taken on: 2005-09-07 13:10:26	60%
GPS	Taken on: 2005-09-07 13:12:45	70%
DGPS-QC	-	

Congratulations! You have passed the course

Overall mark = 71.111111111111%

Click here to return home

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Whatever.....

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News

Geodetic Solutions News

September 2005

Michael Barnes from Cain & Barnes, Houston, Texas becomes the first poerson to successfully complete Geodetic Solutions' online training course in geodesy.

Barnes achieved marks of 70% in Basic Geodesy, 80% in Coordinate Reference Systems and a disappointing 60% in Datums.

Despite over 20 years in the industry, Barnes' limited IT literacy bears testimony to the ease of the site proving that if he can do it - even the Ape Man of the Indus can follow in his footsteps.

Geodetic Solutions provide online training in geodesy, please contact us for further details for affordable, effective, distance learning.

Please do not hesitate to contact Geodetic Solutions for any further details or comments

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Recommendations

- Consider purchase for:
  - Personal professional development
  - Company evaluations
  - In-house training
- Email Martin Rayson with questions, comments and suggestions
- mrayson@geodetic-solutions.com
- Talk to Jim Cain (and others) about availability of geodesy training here in Greater Houston