Spatial Reference Model (SRM)
Accuracy Assessment Procedure
(including test results)

ABSTRACT:

This procedure describes the steps to be taken in assessing the SRM accuracy performance in a consistent way by establishing an assessment method based on a fixed set of Gold Data supplied by NGA and pre-established runtime routines. This document is intended for users who are to independently assess the SRM accuracy in their particular computing environment and capture the results of the assessment in the results section of this document.

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Revision History

Version	Date	Description of Update
v0.1	May 28, 2008	Initial draft for review.
v1.0	June 27, 2008	Initial release.
V1.1	July 10, 2008	Combined document to capture Accuracy Test data conducted by an independent tester.

1 SRM Accuracy Assessment

1.1 Test Item:

The software under test is the SRM C/C++ SDK version 4.3. Only the C++ implementation is currently included in the assessment procedure described in this document. The C and Java implementations of the SRM may be included in the future.

1.2 Description:

The assessment procedure described in this document is for the collection of accuracy metrics related to the execution of the SRM coordinate conversion and transformation operations applied to a select set of coordinates in various spatial reference frames (SRF) supported by the SRM. These SRFs include, but are not limited to, Celestiocentric, Celestiodetic (commonly known as geocentric and geodetic, respectively), and Transverse Mercator. The select set of test coordinates is organized as separate data files, each containing the specification of the reference frame for the associated coordinates. The select set of data is available from the National Geospatial-Intelligence Agency (NGA) as the "gold" coordinate conversion data. The package name containing these test data files is "GoldData_v6.1". For more information on obtaining the NGA "gold" data, please contact Mr. Craig Rollins whose contact information is included in the "Contributors" listed above. A general description of the gold data is in Appendix A.

This assessment is divided into three test categories based on the *NGA gold data*:

- Coordinate conversions between the Celestiodetic SRF and map projection SRFs. The map projection SRFs include Mercator, Transverse Mercator, Lambert Conformal Conic, and Polar Stereographic
- Coordinate conversions between the Celestiodetic SRF and global 3D SRFs
- Coordinate transformations between a Celestiodetic SRF using the WGS 1984 Object Reference Models (ORM) and Celestiodetic SRFs using a number of different ORMs. These are also known as *datum transformations* from the WGS84 datum to various locally defined datums.

Note: The gold data available from NGA supports both the single standard parallel (LCC-1) and the double standard parallel (LCC-2) varieties of the Lambert Conformal Conic map projection. The test data includes test vectors for both. The SRM supports only one of these forms, the LCC-2. Therefore, there are nine data files, related to the LCC SRF under the map projection category, which need to be modified to provide the equivalent SRM LCC parameter set. There is also an error in the line ordering in the NGA_3parDT/Set_A/Local_geodetic_201.csv file. The changes to those files are captured in Appendix E.

The accuracy assessment application (herein called the *Test Driver*) invokes the SRM `changeCoordinateSRF` operation on the coordinate in all the three categories of conversions described above. All coordinate conversion tests are bi-directional, i.e., test data provided in SRF A is converted to SRF B (and the results are compared to the expected gold data values for SRF B), and test data provided in SRF B is converted to SRF A (and the results are compared to the expected gold data values for SRF A). Once the computed coordinates are compared with the gold data, a difference value is computed for each individual test vector. Only those reference frames that are supported by the SRM (and within those only those coordinates that fall within the acceptable domain and range of the given SRF) are included in the test. SRM defines the concept of valid regions for the coordinates, and only coordinates within the valid region can be used in a coordinate operation. For example, in a Celestiodetic SRF, only coordinates whose longitude component value is within the range of (-π, π], and latitude component value is within the range of (-π/2, π/2), and ellipsoidal height component value is greater than the minus semi-minor axis are considered valid.

All tests use the accuracy domain of the SRM default profile (see ISO/IEC 18026 Spatial Reference Model specification for more details). The difference computation is the Euclidean distance between the computed position and the expected position via the gold data (see Appendix F for additional details). Within each category, a coordinate test operation involves a pair of .csv files, where one .csv file serves as the set of input test coordinates and the other serves as the expected set of output values for the corresponding input test coordinates. For each test set, the following statistics are computed on the resulting differences:
1. Number of (input) coordinates used in the test.
2. Minimum.
3. Maximum.

Any coordinate that does not fall within the valid region is excluded from the conversion computation, and from the statistics; hence the number of coordinates accounts for a subset of the input coordinates, excluding those that are not in the valid range or fall outside the accuracy domain.

1.3 Software Information:

The software under test is SRM C++ SDK version 4.3. The Test Driver invokes the necessary SRM initialization and execution of operations for the SRM C++. It also computes and collects the coordinate conversion accuracy metrics.

1.4 Test Driver/Environment Information:

The Test Driver invokes the SRM C++ `changeCoordinateSRF` method to carry out the coordinate test operations according to the test configuration file `test_accuracy_config_all.csv`. This configuration file specifies the path as well as the source and target files for the coordinate operations. The content of the configuration file is in Appendix B.

The output of the accuracy assessment is also stored as a .csv file whose name is specified in the Test Driver argument list. The Test Driver software was written in C++ and supports both WIN32 and Linux platforms, and can be built using the native SRM C/C++ SDK build environment with minimal setup. See the SRM C/C++ SDK documentation for instructions on how to compile and build an SRM application with the SRM API.

1.5 Test Runtime Environment:

Any WIN32 or Linux computing platform supported by the SRM C/C++ SDK can be used to run the SRM performance test. The platform characteristics should be recorded and kept with the test results. As a minimum, the following platform characteristics should be captured:

CPU.   (Example: 2.4 GHz Xeon / 533 Processor)
RAM.   (Example: 1.5 Gb DDR at 266 MHz)
Operating System. (Example: Linux RedHat 8.0)
Compiler.   (Example: GCC v3.2.2)

1.6 Initial Conditions:

It is recommended that all other applications running on the platform be terminated, prior to running the SRM tests for the purposes of efficiency. This includes any background applications that may be part of the operating system functions that may preempt the CPU and force the Test Driver application to wait while the CPU responds to a different program.

1.7 Accuracy Assessment

1.7.1 Description

For the accuracy assessment, the Test Driver invokes the SRM `changeCoordinateSRF` operation according to the input accuracy configuration file. Upon completion of the accuracy assessment execution, two output .csv files are created:

1. srm_conv_accuracy_results.csv - containing the results of coordinate conversion associated with the map projection (map_proj directory)) and global 3D (global_3D directory) gold data.
2. srm_datum_accuracy_results.csv – containing the results of coordinate conversion associated with the datum (NGA_3parDT) gold data.

Example output .csv files are in Appendix C and D.

1.7.2 Test Procedure

This test procedure assumes that `srm_accuracy` (Test Driver) executable is built from the `srm_accuracy.cpp` source code and statically linked to the SRM C++ 4.3 library. The SRM C/C++ SDK 4.3 documentation can be consulted on how to build an executable using SRM. The input configuration file and the top directory of the gold data package should be in the same directory where the Test Driver executable is run.

No.	Step Description	Expected Result

1	`Make changes to the following files under GoldData_v6.1 according to Appendix E:`
	
	`map_proj/Sphere/LCC_60a.csv`
	`map_proj/Sphere/LCC_61.csv`
	`map_proj/Sphere/LCC_67.csv`
	`map_proj/SRMmax/LCC_37a.csv`
	`map_proj/SRMmax/LCC_38.csv`
	`map_proj/SRMmax/LCC_44.csv`
	`map_proj/WGS84/LCC_14a.csv`
	`map_proj/WGS84/LCC_15.csv`
	`map_proj/WGS84/LCC_21.csv`
	`NGA_3parDT/Set_A/`
	`    Local_geodetic_201.csv`
	
	`Note: The gold data files are in MS-DOS text file format with <CR> at the end of each line.  Those must be removed prior to use the files in a Unix system.`
		The LCC SRF parameter set in the gold data is compatible with the SRM specification and the row ordering in `Local_geodetic_201.csv` is fixed.

2	Run the `srm_accuracy` executable with the following command line arguments:
	`srm_accuracy`
	`test_accuracy_config_all.csv`
	
	This configuration file assumes the root of the gold data tree (GoldData_v6.1) to be in the same directory where the test driver resides.
	
	Note: Users can also use a third
		Two messages will appear on the display indicating the beginning and the end of the test as follows:
		"Running SRM accuracy test..." and "Completed accuracy test!"
		The result of the test will be saved in `srm_conv_accuracy_results.csv` and `srm_datum_accuracy_results.csv`.

command line argument "t" to turn on the verbose mode for the output file. In that mode, each conversion result is listed with its corresponding gold data.	

Note: The content of the output file (.csv) can be viewed in Excel.

1.7.3 Actual Accuracy Results

This section is intended for recording the relevant information associated with a particular accuracy assessment experiment including the actual results from that assessment.

Person who performed the assessment:
- Name: Richard L. Matthews
- Affiliation: SAIC, QA/SQA Manager
- Phone #: 407-243-3669
- E-mail: Richard.L.Matthews@saic.com

Accuracy Assessment Execution Information:
- Date (mm/dd/yyyy): 07/01/2008
- Time Started (hh:mm): 04:21:47 pm.
- Time Completed (hh:mm): 04:21:48 pm

Accuracy Assessment computation environment:
- CPU: Xeon 3.06 GHz, 512 KB (L2) & 0 MB (L3)
- RAM: 1.5 Gb DDR at 266 MHz
- Operating System: Linux RedHat 2.6.9-55EL
- Compiler: GCC v3.2.2

Accuracy Assessment Results:

Accuracy results (in tabular form) from the output file: srm_conv_accuracy_results.csv

Coordinate conversion accuracy assessment for SRM C++ 4.3				
(The results are given as the Euclidean distance (in meters) between the computed coordinate				
and the gold data)				
Test conducted: Tue Jul 1 16:21:47 2008				

ORM/RT	Conversion	Count	MIN (m)	MAX (m)
WGE	Lon_Lat.csv to LCC_14.csv	300	1.72E-08	7.20E-06
WGE	LCC_14.csv to Lon_Lat.csv	300	4.57E-08	1.25E-05
WGE	Lon_Lat.csv to LCC_14a.csv	300	2.75E-08	1.76E-05
WGE	LCC_14a.csv to Lon_Lat.csv	300	1.30E-08	1.25E-05
WGE	Lon_Lat.csv to LCC_15.csv	300	6.82E-08	2.33E-06
WGE	LCC_15.csv to Lon_Lat.csv	300	8.50E-09	1.29E-05
WGE	Lon_Lat.csv to LCC_16.csv	300	3.73E-08	1.69E-05
WGE	LCC_16.csv to Lon_Lat.csv	300	3.88E-10	1.26E-05
WGE	Lon_Lat.csv to LCC_16a.csv	300	2.30E-08	1.69E-05
WGE	LCC_16a.csv to Lon_Lat.csv	300	7.37E-09	1.26E-05
WGE	Lon_Lat.csv to LCC_17.csv	300	2.24E-08	2.76E-06
WGE	LCC_17.csv to Lon_Lat.csv	300	3.88E-10	1.21E-05
WGE	Lon_Lat.csv to LCC_18.csv	300	0.000335303	0.010991174
WGE	LCC_18.csv to Lon_Lat.csv	300	3.77E-06	0.000114
WGE	Lon_Lat.csv to LCC_19.csv	300	3.89E-08	2.75E-06
WGE	LCC_19.csv to Lon_Lat.csv	300	3.56E-09	1.29E-05
WGE	Lon_Lat.csv to LCC_20.csv	300	6.87E-08	0.000215433
WGE	LCC_20.csv to Lon_Lat.csv	300	1.16E-07	1.28E-05
WGE	Lon_Lat.csv to LCC_21.csv	300	2.14E-06	0.003401943
WGE	LCC_21.csv to Lon_Lat.csv	300	2.17E-06	8.56E-05
WGE	Lon_Lat.csv to LCC_22.csv	300	0.00816106	0.022236749
WGE	LCC_22.csv to Lon_Lat.csv	300	2.34E-06	0.000155332
WGE	Lon_Lat.csv to LCC_23.csv	Exception: Incompatible SRF Parameter Set		
WGE	LCC_23.csv to Lon_Lat.csv	Exception: Incompatible SRF Parameter Set		
WGE	Lon_Lat.csv to Mercator_5.csv	300	5.64E-06	0.000889801
WGE	Mercator_5.csv to Lon_Lat.csv	300	3.88E-10	1.22E-05
WGE	Lon_Lat.csv to Mercator_5a.csv	300	5.64E-06	0.000889804
WGE	Mercator_5a.csv to Lon_Lat.csv	300	3.88E-10	1.22E-05
WGE	Lon_Lat.csv to Mercator_6.csv	300	4.30E-06	0.000771446
WGE	Mercator_6.csv to Lon_Lat.csv	300	3.88E-10	1.20E-05
WGE	Lon_Lat.csv to Mercator_7.csv	300	4.05E-06	0.00062326
WGE	Mercator_7.csv to Lon_Lat.csv	300	3.88E-10	1.23E-05
WGE	Lon_Lat.csv to Mercator_8.csv	300	5.64E-06	0.000889801
WGE	Mercator_8.csv to Lon_Lat.csv	300	4.08E-10	1.22E-05
WGE	Lon_Lat.csv to Mercator_8a.csv	300	4.30E-06	0.000771446
WGE	Mercator_8a.csv to Lon_Lat.csv	300	4.08E-10	1.20E-05
WGE	Lon_Lat.csv to Mercator_8b.csv	300	4.30E-06	0.000771448
WGE	Mercator_8b.csv to Lon_Lat.csv	300	4.08E-10	1.20E-05
WGE	Lon_Lat.csv to Ney_24.csv	Ney SRF		

		not supported		
WGE	Ney_24.csv to Lon_Lat.csv	Ney SRF not supported		
WGE	Lon_Lat.csv to Ney_25.csv	Ney SRF not supported		
WGE	Ney_25.csv to Lon_Lat.csv	Ney SRF not supported		
WGE	Lon_Lat.csv to PolarStereo_09.csv	252	3.02E-06	0.000593886
WGE	PolarStereo_09.csv to Lon_Lat.csv	220	7.25E-09	1.25E-05
WGE	Lon_Lat.csv to PolarStereo_09a.csv	252	3.02E-06	0.000593886
WGE	PolarStereo_09a.csv to Lon_Lat.csv	220	7.25E-09	1.25E-05
WGE	Lon_Lat.csv to PolarStereo_09b.csv	252	1.67E-06	0.000415821
WGE	PolarStereo_09b.csv to Lon_Lat.csv	207	7.37E-09	1.26E-05
WGE	Lon_Lat.csv to PolarStereo_10.csv	252	2.56E-06	0.000554161
WGE	PolarStereo_10.csv to Lon_Lat.csv	218	2.22E-08	1.26E-05
WGE	Lon_Lat.csv to PolarStereo_11.csv	252	3.06E-06	0.000593782
WGE	PolarStereo_11.csv to Lon_Lat.csv	220	7.25E-09	1.25E-05
WGE	Lon_Lat.csv to PolarStereo_11a.csv	252	2.54E-06	0.000554293
WGE	PolarStereo_11a.csv to Lon_Lat.csv	217	4.39E-08	1.24E-05
WGE	Lon_Lat.csv to PolarStereo_11b.csv	252	2.54E-06	0.000554294
WGE	PolarStereo_11b.csv to Lon_Lat.csv	217	4.39E-08	1.24E-05
WGE	Lon_Lat.csv to PolarStereo_12.csv	252	3.02E-06	0.000593899
WGE	PolarStereo_12.csv to Lon_Lat.csv	220	7.25E-09	1.25E-05
WGE	Lon_Lat.csv to PolarStereo_12a.csv	252	2.56E-06	0.000554174
WGE	PolarStereo_12a.csv to Lon_Lat.csv	218	2.22E-08	1.26E-05
WGE	Lon_Lat.csv to PolarStereo_13.csv	111	1.93E-05	0.000593777
WGE	PolarStereo_13.csv to Lon_Lat.csv	79	7.37E-09	1.16E-05
WGE	Lon_Lat.csv to PolarStereo_13a.csv	111	1.80E-05	0.000554292
WGE	PolarStereo_13a.csv to Lon_Lat.csv	76	4.87E-08	1.17E-05
WGE	Lon_Lat.csv to TransMerc_26.csv	66	2.92E-10	0.000267375
WGE	TransMerc_26.csv to Lon_Lat.csv	66	2.92E-10	0.000190458
WGE	Lon_Lat.csv to TransMerc_26a.csv	66	1.52E-07	0.000267376
WGE	TransMerc_26a.csv to Lon_Lat.csv	64	3.83E-07	0.000190074
WGE	Lon_Lat.csv to TransMerc_27.csv	71	1.01E-06	0.000438464
WGE	TransMerc_27.csv to Lon_Lat.csv	71	8.00E-08	0.000180355
Test_SRMmax	Lon_Lat.csv to LCC_37.csv	300	4.01E-08	7.11E-06
Test_SRMmax	LCC_37.csv to Lon_Lat.csv	300	1.90E-08	0.000381454
Test_SRMmax	Lon_Lat.csv to LCC_37a.csv	Exception: Incompatible SRF Parameter Set		
Test_SRMmax	LCC_37a.csv to Lon_Lat.csv	Exception: Incompatible SRF Parameter Set		

Test_SRMmax	Lon_Lat.csv to LCC_38.csv	300	5.60E-08	1.66E-06
Test_SRMmax	LCC_38.csv to Lon_Lat.csv	300	2.28E-08	0.000381759
Test_SRMmax	Lon_Lat.csv to LCC_39.csv	300	3.29E-08	1.75E-05
Test_SRMmax	LCC_39.csv to Lon_Lat.csv	300	3.87E-10	0.000381624
Test_SRMmax	Lon_Lat.csv to LCC_39a.csv	300	2.58E-08	1.77E-05
Test_SRMmax	LCC_39a.csv to Lon_Lat.csv	300	3.47E-08	0.000381326
Test_SRMmax	Lon_Lat.csv to LCC_40.csv	300	5.27E-08	2.66E-06
Test_SRMmax	LCC_40.csv to Lon_Lat.csv	300	9.24E-10	0.000381477
Test_SRMmax	Lon_Lat.csv to LCC_41.csv	300	0.000297844	0.011025877
Test_SRMmax	LCC_41.csv to Lon_Lat.csv	300	1.40E-07	0.000384079
Test_SRMmax	Lon_Lat.csv to LCC_42.csv	300	1.10E-07	2.91E-06
Test_SRMmax	LCC_42.csv to Lon_Lat.csv	300	3.87E-10	0.000381921
Test_SRMmax	Lon_Lat.csv to LCC_43.csv	300	5.68E-08	0.000212916
Test_SRMmax	LCC_43.csv to Lon_Lat.csv	300	5.88E-08	0.000381774
Test_SRMmax	Lon_Lat.csv to LCC_44.csv	300	2.96E-06	0.00337967
Test_SRMmax	LCC_44.csv to Lon_Lat.csv	300	3.90E-06	0.000454094
Test_SRMmax	Lon_Lat.csv to LCC_45.csv	300	0.00818583	0.022312722
Test_SRMmax	LCC_45.csv to Lon_Lat.csv	300	4.46E-08	0.000399172
Test_SRMmax	Lon_Lat.csv to LCC_46.csv	Exception: Incompatible SRF Parameter Set		
Test_SRMmax	LCC_46.csv to Lon_Lat.csv	Exception: Incompatible SRF Parameter Set		
Test_SRMmax	Lon_Lat.csv to Mercator_28.csv	300	0.000211508	0.052896995
Test_SRMmax	Mercator_28.csv to Lon_Lat.csv	300	3.87E-10	0.000380789
Test_SRMmax	Lon_Lat.csv to Mercator_28a.csv	300	0.000211507	0.052896991
Test_SRMmax	Mercator_28a.csv to Lon_Lat.csv	300	3.87E-10	0.000380789
Test_SRMmax	Lon_Lat.csv to Mercator_29.csv	300	0.000183476	0.045886628
Test_SRMmax	Mercator_29.csv to Lon_Lat.csv	300	3.87E-10	0.000381102
Test_SRMmax	Lon_Lat.csv to Mercator_30.csv	300	0.000148056	0.037028499
Test_SRMmax	Mercator_30.csv to Lon_Lat.csv	300	3.87E-10	0.000381206
Test_SRMmax	Lon_Lat.csv to Mercator_31.csv	300	0.000211508	0.052896995
Test_SRMmax	Mercator_31.csv to Lon_Lat.csv	300	4.07E-10	0.00038079
Test_SRMmax	Lon_Lat.csv to Mercator_31a.csv	300	0.000183476	0.045886628
Test_SRMmax	Mercator_31a.csv to Lon_Lat.csv	300	4.07E-10	0.000381102
Test_SRMmax	Lon_Lat.csv to Mercator_31b.csv	300	0.000183478	0.045886628
Test_SRMmax	Mercator_31b.csv to Lon_Lat.csv	300	4.07E-10	0.0003811
Test_SRMmax	Lon_Lat.csv to Ney_48.csv	Ney SRF not supported		
Test_SRMmax	Ney_48.csv to Lon_Lat.csv	Ney SRF not supported		
Test_SRMmax	Lon_Lat.csv to Ney_47.csv	Ney SRF not supported		

Test_SRMmax	Ney_47.csv to Lon_Lat.csv	Ney SRF not supported		
Test_SRMmax	Lon_Lat.csv to PolarStereo_32.csv	252	0.000419235	0.025855717
Test_SRMmax	PolarStereo_32.csv to Lon_Lat.csv	209	4.81E-08	0.000381512
Test_SRMmax	Lon_Lat.csv to PolarStereo_32a.csv	252	0.000419235	0.025855718
Test_SRMmax	PolarStereo_32a.csv to Lon_Lat.csv	209	4.81E-08	0.000381512
Test_SRMmax	Lon_Lat.csv to PolarStereo_32b.csv	252	0.000293182	0.018098703
Test_SRMmax	PolarStereo_32b.csv to Lon_Lat.csv	224	1.17E-07	0.000381296
Test_SRMmax	Lon_Lat.csv to PolarStereo_33.csv	252	0.000391137	0.024126448
Test_SRMmax	PolarStereo_33.csv to Lon_Lat.csv	215	4.41E-08	0.000381296
Test_SRMmax	Lon_Lat.csv to PolarStereo_34.csv	252	0.000419279	0.025855334
Test_SRMmax	PolarStereo_34.csv to Lon_Lat.csv	212	4.81E-08	0.000381505
Test_SRMmax	Lon_Lat.csv to PolarStereo_34a.csv	252	0.00039118	0.02412669
Test_SRMmax	PolarStereo_34a.csv to Lon_Lat.csv	211	4.39E-08	0.000381441
Test_SRMmax	Lon_Lat.csv to PolarStereo_34b.csv	252	0.00039118	0.024126691
Test_SRMmax	PolarStereo_34b.csv to Lon_Lat.csv	211	4.50E-08	0.000381441
Test_SRMmax	Lon_Lat.csv to PolarStereo_35.csv	252	0.00041925	0.025855723
Test_SRMmax	PolarStereo_35.csv to Lon_Lat.csv	209	4.81E-08	0.000381512
Test_SRMmax	Lon_Lat.csv to PolarStereo_35a.csv	252	0.000391151	0.024126453
Test_SRMmax	PolarStereo_35a.csv to Lon_Lat.csv	215	4.38E-08	0.000381296
Test_SRMmax	Lon_Lat.csv to PolarStereo_36.csv	111	0.000419291	0.02177905
Test_SRMmax	PolarStereo_36.csv to Lon_Lat.csv	71	4.81E-08	0.000353768
Test_SRMmax	Lon_Lat.csv to PolarStereo_36a.csv	111	0.000391187	0.020322356
Test_SRMmax	PolarStereo_36a.csv to Lon_Lat.csv	70	4.45E-08	0.000353839
Test_SRMmax	Lon_Lat.csv to TransMerc_49.csv	66	5.80E-10	0.000637113
Test_SRMmax	TransMerc_49.csv to Lon_Lat.csv	66	5.80E-10	0.002766943
Test_SRMmax	Lon_Lat.csv to TransMerc_49a.csv	66	4.31E-08	0.00063707
Test_SRMmax	TransMerc_49a.csv to Lon_Lat.csv	64	4.08E-08	0.002766985
Test_SRMmax	Lon_Lat.csv to TransMerc_50.csv	71	8.10E-06	0.000636643
Test_SRMmax	TransMerc_50.csv to Lon_Lat.csv	71	6.17E-07	0.002771826
Test_sphere	Lon_Lat.csv to LCC_60.csv	300	2.46E-08	7.02E-06
Test_sphere	LCC_60.csv to Lon_Lat.csv	300	7.32E-10	6.73E-07
Test_sphere	Lon_Lat.csv to LCC_60a.csv	300	4.66E-08	0.000201151
Test_sphere	LCC_60a.csv to Lon_Lat.csv	300	6.82E-10	4.52E-06
Test_sphere	Lon_Lat.csv to LCC_61.csv	300	1.30E-07	1.85E-06
Test_sphere	LCC_61.csv to Lon_Lat.csv	300	1.67E-09	1.01E-06
Test_sphere	Lon_Lat.csv to LCC_62.csv	300	3.63E-08	1.61E-05
Test_sphere	LCC_62.csv to Lon_Lat.csv	300	1.21E-09	7.95E-07
Test_sphere	Lon_Lat.csv to LCC_62a.csv	300	2.56E-08	1.60E-05
Test_sphere	LCC_62a.csv to Lon_Lat.csv	300	9.02E-10	7.02E-07
Test_sphere	Lon_Lat.csv to LCC_63.csv	300	2.53E-08	2.49E-06
Test_sphere	LCC_63.csv to Lon_Lat.csv	300	1.71E-09	8.79E-07
Test_sphere	Lon_Lat.csv to LCC_64.csv	300	0.000244566	0.010972323
Test_sphere	LCC_64.csv to Lon_Lat.csv	300	9.67E-07	4.13E-05
Test_sphere	Lon_Lat.csv to LCC_65.csv	300	1.60E-07	2.73E-06
Test_sphere	LCC_65.csv to Lon_Lat.csv	300	2.22E-09	2.79E-06
Test_sphere	Lon_Lat.csv to LCC_66.csv	300	2.84E-08	0.000219034
Test_sphere	LCC_66.csv to Lon_Lat.csv	300	2.66E-08	1.08E-06

Test_sphere	Lon_Lat.csv to LCC_67.csv	300	2.16E-06	0.003429364
Test_sphere	LCC_67.csv to Lon_Lat.csv	300	2.16E-06	7.50E-05
Test_sphere	Lon_Lat.csv to LCC_68.csv	300	0.008144313	0.022194565
Test_sphere	LCC_68.csv to Lon_Lat.csv	300	3.21E-06	0.000141548
Test_sphere	Lon_Lat.csv to LCC_69.csv	Exception: Incompatible SRF Parameter Set		
Test_sphere	LCC_69.csv to Lon_Lat.csv	Exception: Incompatible SRF Parameter Set		
Test_sphere	Lon_Lat.csv to Mercator_51.csv	300	4.84E-08	8.34E-06
Test_sphere	Mercator_51.csv to Lon_Lat.csv	300	3.90E-10	5.88E-07
Test_sphere	Lon_Lat.csv to Mercator_51a.csv	300	4.84E-08	8.34E-06
Test_sphere	Mercator_51a.csv to Lon_Lat.csv	300	3.90E-10	5.86E-07
Test_sphere	Lon_Lat.csv to Mercator_52.csv	300	2.79E-08	7.94E-06
Test_sphere	Mercator_52.csv to Lon_Lat.csv	300	3.90E-10	6.10E-07
Test_sphere	Lon_Lat.csv to Mercator_53.csv	300	9.31E-10	6.35E-06
Test_sphere	Mercator_53.csv to Lon_Lat.csv	300	3.90E-10	8.10E-07
Test_sphere	Lon_Lat.csv to Mercator_54.csv	300	1.16E-07	8.35E-06
Test_sphere	Mercator_54.csv to Lon_Lat.csv	300	3.91E-10	6.56E-07
Test_sphere	Lon_Lat.csv to Mercator_54a.csv	300	9.13E-08	7.95E-06
Test_sphere	Mercator_54a.csv to Lon_Lat.csv	300	4.10E-10	7.81E-07
Test_sphere	Lon_Lat.csv to Mercator_54b.csv	300	9.31E-08	7.96E-06
Test_sphere	Mercator_54b.csv to Lon_Lat.csv	300	4.10E-10	7.82E-07
Test_sphere	Lon_Lat.csv to Ney_71.csv	Ney SRF not supported		
Test_sphere	Ney_71.csv to Lon_Lat.csv	Ney SRF not supported		
Test_sphere	Lon_Lat.csv to Ney_70.csv	Ney SRF not supported		
Test_sphere	Ney_70.csv to Lon_Lat.csv	Ney SRF not supported		
Test_sphere	Lon_Lat.csv to PolarStereo_55.csv	252	1.86E-09	1.13E-06
Test_sphere	PolarStereo_55.csv to Lon_Lat.csv	223	1.97E-09	5.90E-07
Test_sphere	Lon_Lat.csv to PolarStereo_55a.csv	252	1.86E-09	1.13E-06
Test_sphere	PolarStereo_55a.csv to Lon_Lat.csv	223	1.97E-09	5.89E-07
Test_sphere	Lon_Lat.csv to PolarStereo_55b.csv	252	4.66E-09	8.59E-07
Test_sphere	PolarStereo_55b.csv to Lon_Lat.csv	230	3.60E-08	8.84E-07
Test_sphere	Lon_Lat.csv to PolarStereo_56.csv	252	0	1.17E-06
Test_sphere	PolarStereo_56.csv to Lon_Lat.csv	219	7.04E-09	6.88E-07
Test_sphere	Lon_Lat.csv to PolarStereo_57.csv	252	2.24E-08	9.40E-07
Test_sphere	PolarStereo_57.csv to Lon_Lat.csv	226	4.08E-08	6.38E-07
Test_sphere	Lon_Lat.csv to PolarStereo_57a.csv	252	2.28E-08	1.09E-06

Test_sphere	PolarStereo_57a.csv to Lon_Lat.csv	220	3.67E-08	6.88E-07
Test_sphere	Lon_Lat.csv to PolarStereo_57b.csv	252	2.28E-08	1.09E-06
Test_sphere	PolarStereo_57b.csv to Lon_Lat.csv	220	3.67E-08	6.88E-07
Test_sphere	Lon_Lat.csv to PolarStereo_58.csv	252	2.06E-22	1.13E-06
Test_sphere	PolarStereo_58.csv to Lon_Lat.csv	223	1.97E-09	5.90E-07
Test_sphere	Lon_Lat.csv to PolarStereo_58a.csv	252	5.59E-09	1.17E-06
Test_sphere	PolarStereo_58a.csv to Lon_Lat.csv	219	7.04E-09	6.88E-07
Test_sphere	Lon_Lat.csv to PolarStereo_59.csv	111	5.95E-08	9.67E-07
Test_sphere	PolarStereo_59.csv to Lon_Lat.csv	85	4.08E-08	5.58E-07
Test_sphere	Lon_Lat.csv to PolarStereo_59a.csv	111	2.24E-08	1.13E-06
Test_sphere	PolarStereo_59a.csv to Lon_Lat.csv	79	5.49E-08	6.89E-07
Test_sphere	Lon_Lat.csv to TransMerc_72.csv	66	1.17E-07	5.66E-07
Test_sphere	TransMerc_72.csv to Lon_Lat.csv	66	9.94E-09	8.72E-05
Test_sphere	Lon_Lat.csv to TransMerc_72a.csv	66	3.47E-08	5.86E-07
Test_sphere	TransMerc_72a.csv to Lon_Lat.csv	64	2.37E-08	8.72E-05
Test_sphere	Lon_Lat.csv to TransMerc_73.csv	71	6.15E-08	8.02E-07
Test_sphere	TransMerc_73.csv to Lon_Lat.csv	71	9.77E-08	0.00049594
WGE	geodetic_101.csv to rectangular_103.csv	465	1.51E-07	0.000101435
WGE	rectangular_103.csv to geodetic_101.csv	451	0	0.000878061
WGE	geodetic_101.csv to spherical_104.csv	Spherical SRF not supported		
WGE	spherical_104.csv to geodetic_101.csv	Spherical SRF not supported		
WGE	geodetic_101.csv to ellipsoidal_105.csv	Ellipsoidal SRF not supported		
WGE	ellipsoidal_105.csv to geodetic_101.csv	Ellipsoidal SRF not supported		
Test_SRMmax	geodetic_106.csv to rectangular_108.csv	465	1.19E-07	0.00159106
Test_SRMmax	rectangular_108.csv to geodetic_106.csv	449	0	0.01414027
Test_SRMmax	geodetic_106.csv to spherical_109.csv	Spherical SRF not supported		
Test_SRMmax	spherical_109.csv to geodetic_106.csv	Spherical SRF not supported		
Test_SRMmax	geodetic_106.csv to ellipsoidal_110.csv	Ellipsoidal SRF not supported		
Test_SRMmax	ellipsoidal_110.csv to geodetic_106.csv	Ellipsoidal SRF not supported		

Accuracy results (in tabular form) from the output file: srm_datum_accuracy_results.csv

Datum conversion accuracy assessment for SRM C++ 4.3				
(The results are given as the Euclidean distance (in meters) between the c				
omputed coordinate and the gold data)				
Test conducted: Tue Jul 1 16:21:47 2008				
Src ORM	Tgt ORM	Count	MIN (m)	MAX (m)
ADI-M	WGE	63	8.54E-05	0.000684642
ADI-A	WGE	25	0.000105818	0.0006494
ADI-B	WGE	63	5.80E-05	0.000723124
ADI-C	WGE	25	0.000144708	0.000652347
ADI-D	WGE	25	0.000137294	0.00068808
ADI-E	WGE	25	0.000183737	0.000711852
ADI-F	WGE	25	3.43E-05	0.000758913
AFG	WGE	42	0.000114321	0.000728825
AIA	WGE	4	0.000240998	0.000513414
AIN-A	WGE	4	0.000283307	0.000527795
AIN-B	WGE	63	9.47E-05	0.000700913
AMA	WGE	9	0.000260293	0.000704998
ANO	WGE	9	0.000258707	0.000727196
ARF-M	WGE	81	5.22E-05	0.000735853
ARF-A	WGE	25	0.000180815	0.000681852
ARF-B	WGE	9	0.000138551	0.000637506
ARF-C	WGE	15	7.70E-05	0.000617338
ARF-D	WGE	12	0.00022552	0.00059368
ARF-E	WGE	25	8.44E-05	0.000699828
ARF-F	WGE	30	9.77E-05	0.000683512
ARF-G	WGE	25	0.000140819	0.000579484
ARF-H	WGE	20	0.000185902	0.00069957
ARS-M	WGE	25	0.000179488	0.000594502
ARS-A	WGE	25	5.55E-05	0.000719835
ARS-B	WGE	25	0.000135959	0.000668792
ASC	WGE	4	8.94E-05	0.000337742
ASM	WGE	4	0.000378167	0.000548449
ASQ	WGE	4	0.000329369	0.000603411
ATF	WGE	4	0.000311038	0.000523806
AUA	WGE	81	8.61E-05	0.000706503
AUG	WGE	81	0.000127065	0.0007572
BAT	WGE	91	9.45E-05	0.000756749
BID	WGE	25	7.04E-05	0.000714598

BER	WGE	4	0.00037664	0.000669574
BOO	WGE	20	0.000178085	0.000665437
BUR	WGE	9	0.000217152	0.000679891
CAC	WGE	45	2.67E-05	0.00065863
CAI	WGE	35	9.69E-05	0.000637626
CAO	WGE	20	0	0.000770735
CAP	WGE	30	0.000145037	0.000697075
CAZ	WGE	24	6.83E-05	0.000540679
CCD	WGE	15	0.000112712	0.00052543
CGE	WGE	25	0.000102108	0.000665892
CHI	WGE	9	0	0.000563269
CHU	WGE	25	6.76E-05	0.00067707
COA	WGE	63	7.44E-05	0.000732796
DAL	WGE	12	0.000115226	0.000708462
DID	WGE	4	8.58E-05	0.000515911
DOB	WGE	4	0.000328224	0.00054974
EAS	WGE	4	6.17E-05	0.000614598
ENW	WGE	12	7.01E-05	0.000661147
EST	WGE	12	0.000112394	0.000521635
EUR-M	WGE	55	5.43E-05	0.000633578
EUR-A	WGE	117	3.53E-05	0.00061689
EUR-B	WGE	35	6.66E-05	0.000630631
EUR-C	WGE	25	6.77E-05	0.000539165
EUR-D	WGE	30	0.000122463	0.000653638
EUR-E	WGE	4	0.000190031	0.000445663
EUR-F	WGE	25	0.000150735	0.000611432
EUR-G	WGE	9	0.000114872	0.000522265
EUR-H	WGE	25	0.000103889	0.000663342
EUR-I	WGE	9	0.000390165	0.000658891
EUR-J	WGE	9	0.000281136	0.000625285
EUR-K	WGE	12	0.000114872	0.000574189
EUR-L	WGE	4	0.000411874	0.000535094
EUR-S	WGE	35	0.000143912	0.00070987
EUR-T	WGE	25	7.63E-05	0.000707502
EUS	WGE	77	9.26E-05	0.000650271
FAH	WGE	25	0.000134827	0.000602927
FLO	WGE	4	0.00022254	0.000608684
FOT	WGE	4	0.000207135	0.000627759
GAA	WGE	6	0.000244319	0.000586756
GEO	WGE	16	0.000206976	0.000692308
GIZ	WGE	4	0.000188095	0.000525814
GRA	WGE	4	0.000327926	0.000553452
GUA	WGE	4	0.000309979	0.000516175
GSE	WGE	16	7.85E-05	0.000699498
HEN	WGE	25	0.000109156	0.000683222
HER	WGE	15	6.81E-05	0.000641941
HIT	WGE	45	7.21E-05	0.000693309
HJO	WGE	15	0.000133636	0.000551836

HKD	WGE	6	0.000264309	0.000619737
HTN	WGE	9	0.000304179	0.00068087
IBE	WGE	4	0.000366707	0.00056609
IDN	WGE	36	3.92E-05	0.000714425
IND-B	WGE	20	0.000143169	0.000560501
IND-I	WGE	35	0.000108714	0.00068129
IND-P	WGE	35	6.92E-05	0.000669631
INF-A	WGE	35	0.000169563	0.000775714
ING-A	WGE	15	0.000221379	0.00053091
ING-B	WGE	4	0.000277255	0.000718772
INH-A	WGE	20	5.14E-05	0.000608662
INH-A1	WGE	20	0.000175495	0.000683589
IRL	WGE	6	0.000235761	0.000568065
ISG	WGE	4	0.000362427	0.000509001
IST	WGE	9	0.000325369	0.000696347
JOH	WGE	6	0.000269742	0.000589636
KAN	WGE	9	7.12E-05	0.000567719
KEG	WGE	8	0.000295817	0.000519926
KEA	WGE	12	0.000126381	0.000585904
KUS	WGE	15	0.000205616	0.000690749
LCF	WGE	4	8.57E-05	0.000448697
LEH	WGE	20	0.000109584	0.000655992
LIB	WGE	20	4.60E-05	0.000762069
LUZ-A	WGE	15	0.000132874	0.00060412
LUZ-B	WGE	9	0.00019091	0.00074567
MAS	WGE	20	0.00011259	0.000675895
MER	WGE	25	8.35E-05	0.000682754
MID	WGE	6	0	0.000650487
MIK	WGE	4	0.000477092	0.000613508
MIN-A	WGE	25	0.000101454	0.000665833
MIN-B	WGE	25	2.46E-05	0.000638781
MOD	WGE	9	0.000149807	0.000598046
MPO	WGE	12	0.000103512	0.000635406
MVS	WGE	4	0.000288573	0.000600769
NAH-A	WGE	4	0.000128153	0.000579904
NAH-B	WGE	20	0.000109811	0.000640316
NAH-C	WGE	63	8.01E-05	0.000718022
NAP	WGE	4	0.000266131	0.000607914
NAR-A	WGE	20	6.67E-05	0.00012028
NAR-B	WGE	24	0	0.000127449
NAR-C	WGE	16	5.32E-05	0.000128364
NAR-D	WGE	24	3.94E-05	0.000125087
NAR-E	WGE	50	0	0.000525696
NAR-H	WGE	9	0.000333916	0.000690007
NAS-A	WGE	35	6.63E-05	0.000685805
NAS-B	WGE	30	0.000112286	0.000667972
NAS-C	WGE	36	0.000125132	0.000727298
NAS-D	WGE	30	6.42E-05	0.000627039

NAS-E	WGE	77	0	0.000630362
NAS-F	WGE	15	0.000198479	0.000617137
NAS-G	WGE	36	0.000134434	0.000581451
NAS-H	WGE	20	0.000144706	0.000579886
NAS-I	WGE	45	0	0.000624455
NAS-J	WGE	35	0.000126721	0.000559537
NAS-L	WGE	40	0.000127575	0.000685584
NAS-N	WGE	12	9.06E-05	0.000590943
NAS-O	WGE	9	0.000259704	0.00064464
NAS-P	WGE	20	0.00033707	0.000727724
NAS-Q	WGE	9	0.000163469	0.000516754
NAS-R	WGE	4	0.000270396	0.000664794
NAS-T	WGE	12	6.20E-05	0.000604059
NAS-U	WGE	12	8.90E-05	0.000393657
NAS-V	WGE	15	0	0.000626602
NAS-W	WGE	9	0.000233281	0.000470317
NSD	WGE	30	0.000134402	0.000699003
OEG	WGE	9	0.000279764	0.000538667
OGB-M	WGE	9	0.000177521	0.000563634
OGB-A	WGE	9	0.000129097	0.000627565
OGB-B	WGE	9	0.000300888	0.000547322
OGB-C	WGE	20	0.000123462	0.000554751
OGB-D	WGE	9	8.80E-05	0.000431784
OHA-M	WGE	9	6.84E-05	0.000614346
OHA-A	WGE	6	0.00016454	0.00066302
OHA-B	WGE	6	0.000291115	0.000539289
OHA-C	WGE	4	0.000163868	0.000536061
OHA-D	WGE	6	7.85E-05	0.000534923
OHI-M	WGE	9	0.000171089	0.000678612
OHI-A	WGE	4	0.000312592	0.000613958
OHI-B	WGE	6	0.000288446	0.000698195
OHI-C	WGE	4	0.000269838	0.000556604
OHI-D	WGE	6	9.80E-05	0.000510237
PHA	WGE	12	0.000171275	0.000615593
PIT	WGE	12	0.000191629	0.000602027
PLN	WGE	6	0.000159307	0.000404303
POS	WGE	6	0.000205015	0.000592901
PRP-A	WGE	25	3.30E-05	0.000750633
PRP-B	WGE	45	7.60E-05	0.000591325
PRP-C	WGE	45	9.89E-05	0.000638079
PRP-D	WGE	25	8.15E-05	0.000589556
PRP-E	WGE	16	1.15E-05	0.000627652
PRP-F	WGE	20	0.000149189	0.000676833
PRP-G	WGE	25	0.000143643	0.000661273
PRP-H	WGE	30	0.00013037	0.000740231
PRP-M	WGE	45	8.68E-05	0.000659442
PTB	WGE	27	8.80E-05	0.0007232
PTN	WGE	20	0.000149423	0.000655785

PUK	WGE	198	0	0.000673067
PUR	WGE	9	0.000160724	0.000613164
QAT	WGE	12	0.000258424	0.000580034
QUO	WGE	55	4.55E-05	0.000570508
REU	WGE	16	0.00019652	0.000661427
SAE	WGE	16	0.00010207	0.000723964
SAO	WGE	4	0.00042387	0.000567264
SAP	WGE	9	0.00020204	0.000565732
SAN-M	WGE	56	5.33E-05	0.000609902
SAN-A	WGE	40	8.54E-05	0.000722656
SAN-B	WGE	25	0.000156802	0.000673737
SAN-C	WGE	49	6.76E-05	0.000738718
SAN-D	WGE	45	9.08E-05	0.000579344
SAN-E	WGE	25	0.00012277	0.000717943
SAN-F	WGE	16	0.000192507	0.000758899
SAN-G	WGE	20	0.000214509	0.000646604
SAN-H	WGE	25	2.33E-05	0.000696524
SAN-I	WGE	25	0.000101969	0.000713799
SAN-J	WGE	4	0.000183761	0.0003591
SAN-K	WGE	9	7.24E-05	0.000669401
SAN-L	WGE	30	0.000136471	0.000618511
SCK	WGE	25	4.30E-05	0.000672571
SGM	WGE	4	0.000204267	0.000655746
SHB	WGE	4	8.93E-05	0.000635946
SOA	WGE	4	0.00039061	0.000711257
SPK-A	WGE	12	0.000190243	0.000531821
SPK-B	WGE	15	0.000159604	0.000615961
SPK-C	WGE	15	0.000101144	0.000605907
SPK-D	WGE	9	0.000220191	0.000545911
SPK-E	WGE	36	9.19E-05	0.000639571
SPK-F	WGE	9	0.000271059	0.000557747
SPK-G	WGE	25	0.000139511	0.000638973
SRL	WGE	16	0.000308706	0.00066131
TAN	WGE	15	0.000132817	0.000661405
TDC	WGE	4	9.36E-05	0.000439345
TIL	WGE	25	3.64E-05	0.000730891
TOY-A	WGE	25	0.000109331	0.000658777
TOY-B	WGE	20	0.00014856	0.000628057
TOY-B1	WGE	20	0.00018167	0.000645249
TOY-C	WGE	16	0.000122943	0.000598781
TOY-M	WGE	36	0.000104288	0.000691117
TRN	WGE	4	0.000161744	0.0005664
VOI	WGE	30	8.38E-05	0.000710045
VOR	WGE	30	0.000109436	0.000722174
WAK	WGE	4	3.26E-05	0.000563577
YAC	WGE	16	0.000181169	0.000650686
ZAN	WGE	30	0.000165235	0.000747562
KGS	WGE	20	4.66E-05	8.26E-05

SIR	WGE	44	9.18E-05	0.000114183
WGE	ADI-M	63	6.96E-05	0.000710115
WGE	ADI-A	25	0.000105841	0.000710993
WGE	ADI-B	63	5.85E-05	0.000707018
WGE	ADI-C	25	8.21E-05	0.000734702
WGE	ADI-D	25	9.00E-05	0.000700153
WGE	ADI-E	25	0.000115618	0.000632979
WGE	ADI-F	25	7.56E-05	0.00060042
WGE	AFG	42	4.83E-05	0.00073857
WGE	AIA	4	0.000293025	0.000708348
WGE	AIN-A	4	0.000266175	0.0005175
WGE	AIN-B	63	4.02E-05	0.000695223
WGE	AMA	9	0.000126012	0.000624889
WGE	ANO	9	0.0001104	0.000652919
WGE	ARF-M	81	5.84E-05	0.000736966
WGE	ARF-A	25	6.20E-05	0.000648737
WGE	ARF-B	9	0.000122162	0.000597794
WGE	ARF-C	15	9.00E-05	0.00055598
WGE	ARF-D	12	0.000255548	0.000695512
WGE	ARF-E	25	0.000127232	0.000692213
WGE	ARF-F	30	4.72E-05	0.000753014
WGE	ARF-G	25	3.65E-05	0.000692977
WGE	ARF-H	20	0.000168261	0.000681075
WGE	ARS-M	25	0.000171151	0.000740625
WGE	ARS-A	25	0.000130313	0.00069646
WGE	ARS-B	25	6.38E-05	0.00060377
WGE	ASC	4	0.00039905	0.000517282
WGE	ASM	4	0.00019174	0.000634193
WGE	ASQ	4	0.000148054	0.000334313
WGE	ATF	4	0.000166756	0.000561965
WGE	AUA	81	5.95E-05	0.000712344
WGE	AUG	81	0.000111741	0.000722067
WGE	BAT	91	1.27E-05	0.000748585
WGE	BID	25	5.67E-05	0.000636551
WGE	BER	4	0.00045524	0.000710119
WGE	BOO	20	1.49E-05	0.000666942
WGE	BUR	9	0.000176826	0.00057658
WGE	CAC	45	0.000109429	0.000686997
WGE	CAI	35	0.000195648	0.000686018
WGE	CAO	20	0	0.000615634
WGE	CAP	30	0.000172767	0.000625049
WGE	CAZ	24	4.18E-05	0.000560521
WGE	CCD	15	0.000159803	0.000650989
WGE	CGE	25	0.000138679	0.000564562
WGE	CHI	9	0	0.00048833
WGE	CHU	25	0.000108738	0.000663199
WGE	COA	63	0.000123045	0.000745342
WGE	DAL	12	0.000245985	0.000712808

WGE	DID	4	0.00020187	0.000361867
WGE	DOB	4	0.000275821	0.000497592
WGE	EAS	4	0.000277388	0.000478687
WGE	ENW	12	4.22E-05	0.00063519
WGE	EST	12	5.58E-05	0.000513015
WGE	EUR-M	55	0.000102941	0.000597288
WGE	EUR-A	117	2.17E-05	0.000678612
WGE	EUR-B	35	9.24E-05	0.000612753
WGE	EUR-C	25	2.79E-05	0.000582073
WGE	EUR-D	30	0.000132918	0.00060734
WGE	EUR-E	4	0.0001373	0.000577683
WGE	EUR-F	25	9.97E-05	0.00068146
WGE	EUR-G	9	0.000234461	0.000556832
WGE	EUR-H	25	0.000158668	0.000677713
WGE	EUR-I	9	0.000152256	0.000650567
WGE	EUR-J	9	0.000194818	0.000583017
WGE	EUR-K	12	0.000114029	0.00062574
WGE	EUR-L	4	0.000198664	0.000392803
WGE	EUR-S	35	0.000105356	0.00069497
WGE	EUR-T	25	0.000132305	0.000571592
WGE	EUS	77	5.51E-05	0.00060996
WGE	FAH	25	0.00012285	0.000750286
WGE	FLO	4	0.000230897	0.000558945
WGE	FOT	4	0.000130077	0.000420935
WGE	GAA	6	0.000391677	0.000753792
WGE	GEO	16	0.000181878	0.000596917
WGE	GIZ	4	0.000274214	0.00048644
WGE	GRA	4	0.000277924	0.000607395
WGE	GUA	4	0.000469856	0.000545871
WGE	GSE	16	0.000157072	0.000693822
WGE	HEN	25	9.12E-05	0.000695661
WGE	HER	15	0.00011738	0.00060998
WGE	HIT	45	0.000108003	0.000645463
WGE	HJO	15	0.000123774	0.000585965
WGE	HKD	6	0.00020756	0.000601612
WGE	HTN	9	6.25E-05	0.00063239
WGE	IBE	4	0.000289285	0.000386133
WGE	IDN	36	3.17E-05	0.000701515
WGE	IND-B	20	0.000132788	0.000713757
WGE	IND-I	35	8.88E-05	0.00062518
WGE	IND-P	35	0.000132185	0.000732735
WGE	INF-A	35	9.91E-05	0.00073895
WGE	ING-A	15	0.000177577	0.000622238
WGE	ING-B	4	0.00037982	0.000588628
WGE	INH-A	20	0.000126337	0.000621362
WGE	INH-A1	20	8.22E-05	0.000722903
WGE	IRL	6	0.000239945	0.000531288
WGE	ISG	4	0.000164848	0.000277241

WGE	IST	9	3.02E-05	0.000487117
WGE	JOH	6	0.000137985	0.000499274
WGE	KAN	9	0.000188103	0.000696863
WGE	KEG	8	0.000224323	0.000582632
WGE	KEA	12	0.000181394	0.000643392
WGE	KUS	15	9.01E-05	0.000740376
WGE	LCF	4	0.000163077	0.000562757
WGE	LEH	20	6.25E-05	0.00063326
WGE	LIB	20	9.54E-05	0.000659493
WGE	LUZ-A	15	0.00031592	0.000626369
WGE	LUZ-B	9	0.000226247	0.000661265
WGE	MAS	20	2.67E-05	0.000686514
WGE	MER	25	0.000170612	0.000573632
WGE	MID	6	0	0.000702432
WGE	MIK	4	0.000193327	0.000741837
WGE	MIN-A	25	0.000146354	0.00060368
WGE	MIN-B	25	7.98E-05	0.000738972
WGE	MOD	9	0.000154044	0.000653483
WGE	MPO	12	0.000139347	0.000667872
WGE	MVS	4	0.000324789	0.000513094
WGE	NAH-A	4	0.000108205	0.000399353
WGE	NAH-B	20	3.66E-05	0.000664077
WGE	NAH-C	63	0.000136838	0.000684133
WGE	NAP	4	0.000282813	0.000631714
WGE	NAR-A	20	6.67E-05	0.000120516
WGE	NAR-B	24	0	0.000127298
WGE	NAR-C	16	5.30E-05	0.000127909
WGE	NAR-D	24	3.96E-05	0.000124971
WGE	NAR-E	50	0	0.000524259
WGE	NAR-H	9	0.000333614	0.000690431
WGE	NAS-A	35	0.000116748	0.000696005
WGE	NAS-B	30	0.000109429	0.000702192
WGE	NAS-C	36	0.000122784	0.000671081
WGE	NAS-D	30	6.89E-05	0.000558409
WGE	NAS-E	77	0	0.000610275
WGE	NAS-F	15	5.91E-05	0.000574845
WGE	NAS-G	36	0.000110314	0.000565075
WGE	NAS-H	20	6.63E-05	0.000580277
WGE	NAS-I	45	0	0.000587167
WGE	NAS-J	35	6.43E-05	0.00059334
WGE	NAS-L	40	0.000158156	0.000694934
WGE	NAS-N	12	0.000287072	0.000665786
WGE	NAS-O	9	0.000263389	0.000607297
WGE	NAS-P	20	0.000218227	0.000681718
WGE	NAS-Q	9	0.000258982	0.000568011
WGE	NAS-R	4	0.000466842	0.000572815
WGE	NAS-T	12	9.27E-05	0.000671158
WGE	NAS-U	12	6.16E-05	0.000520044

WGE	NAS-V	15	0	0.000625816
WGE	NAS-W	9	0.000204252	0.000468998
WGE	NSD	30	0.000138823	0.000694744
WGE	OEG	9	0.000213584	0.000687613
WGE	OGB-M	9	0.000229491	0.000561443
WGE	OGB-A	9	0.000240746	0.000497823
WGE	OGB-B	9	0.000124444	0.000500536
WGE	OGB-C	20	6.56E-05	0.000572202
WGE	OGB-D	9	0.000194778	0.000570133
WGE	OHA-M	9	0.000259371	0.000594827
WGE	OHA-A	6	2.93E-05	0.000597136
WGE	OHA-B	6	0.000330429	0.000668169
WGE	OHA-C	4	0.000217834	0.000426203
WGE	OHA-D	6	0.000142186	0.000596868
WGE	OHI-M	9	0.000131452	0.000628242
WGE	OHI-A	4	0.00021105	0.000582951
WGE	OHI-B	6	0.000177354	0.000694184
WGE	OHI-C	4	0.000207464	0.000339504
WGE	OHI-D	6	0.000129098	0.000644968
WGE	PHA	12	0.000181134	0.00062449
WGE	PIT	12	4.97E-05	0.000650271
WGE	PLN	6	6.61E-05	0.000547637
WGE	POS	6	0.000218397	0.000607834
WGE	PRP-A	25	0.000115302	0.00070559
WGE	PRP-B	45	6.17E-05	0.000717811
WGE	PRP-C	45	0.000152771	0.000652974
WGE	PRP-D	25	9.84E-05	0.000743578
WGE	PRP-E	16	6.44E-05	0.000658808
WGE	PRP-F	20	8.17E-05	0.00072202
WGE	PRP-G	25	4.14E-05	0.000630296
WGE	PRP-H	30	0.000155094	0.000751017
WGE	PRP-M	45	8.83E-05	0.00064328
WGE	PTB	27	0.000176667	0.000746232
WGE	PTN	20	6.12E-05	0.000675427
WGE	PUK	198	0	0.00063426
WGE	PUR	9	8.36E-05	0.000691483
WGE	QAT	12	9.61E-05	0.000698633
WGE	QUO	55	4.85E-05	0.000559209
WGE	REU	16	0.000119229	0.000712715
WGE	SAE	16	5.57E-05	0.0005376
WGE	SAO	4	0.000166147	0.000641543
WGE	SAP	9	0.000189163	0.000538439
WGE	SAN-M	56	7.47E-05	0.000626661
WGE	SAN-A	40	8.33E-05	0.000633904
WGE	SAN-B	25	0.000129591	0.000670149
WGE	SAN-C	49	0.000104049	0.00075624
WGE	SAN-D	45	7.62E-05	0.000659999
WGE	SAN-E	25	0.000123535	0.000597636

WGE	SAN-F	16	0.000155047	0.000677005
WGE	SAN-G	20	8.75E-05	0.000741358
WGE	SAN-H	25	5.02E-05	0.000628216
WGE	SAN-I	25	7.37E-05	0.000701575
WGE	SAN-J	4	0.000123044	0.000489586
WGE	SAN-K	9	0.00023189	0.000616875
WGE	SAN-L	30	0.000132121	0.000677615
WGE	SCK	25	4.54E-05	0.000722009
WGE	SGM	4	0.000282893	0.000624404
WGE	SHB	4	0.000257694	0.000535007
WGE	SOA	4	0.000442329	0.000744626
WGE	SPK-A	12	0.000157815	0.00043801
WGE	SPK-B	15	0.000112446	0.000587491
WGE	SPK-C	15	0.000106263	0.00063832
WGE	SPK-D	9	0.000101754	0.000551332
WGE	SPK-E	36	9.88E-05	0.000588404
WGE	SPK-F	9	0.000146901	0.000573966
WGE	SPK-G	25	0.000100479	0.000601207
WGE	SRL	16	0.000201462	0.000630802
WGE	TAN	15	8.70E-05	0.000676493
WGE	TDC	4	0.000194917	0.000590334
WGE	TIL	25	3.37E-05	0.000588598
WGE	TOY-A	25	5.42E-05	0.000633798
WGE	TOY-B	20	0.000211253	0.000602632
WGE	TOY-B1	20	0.000143525	0.000646692
WGE	TOY-C	16	7.58E-05	0.000684479
WGE	TOY-M	36	0.000153401	0.000646158
WGE	TRN	4	8.82E-05	0.000529403
WGE	VOI	30	0.000125924	0.000637432
WGE	VOR	30	0.000105543	0.000701086
WGE	WAK	4	0.000176643	0.000483662
WGE	YAC	16	0.000158541	0.000694575
WGE	ZAN	30	0.000147373	0.000730516
WGE	KGS	20	4.66E-05	8.26E-05
WGE	SIR	44	9.23E-05	0.000114192

Notes and/or Conclusions:

1. Per paragraph 1.7.2 in this procedure, QA verified that the 10 changes to the files listed in the Step Description under GoldData_v6.1 were changed on 01 Jul 08 prior to running the test.
2. The results from the accuracy test of 01 Jul 08 produced two test result files (a) srm_conv_accuracy_results.csv and (b) srm_datum_accuracy_results.csv. Both test result files are included in this document under Accuracy Assessment Results.
3. As noted in Paragraph 1.2 Description, the gold data available from NGA supports two forms of Lambert Conformal Conic (LCC) parameter. The SRM supports only one of these forms. Therefore, there are nine data files (referenced in Appendix E of this procedure), related to the LCC SRF under the map projection category, which need to be modified to provide the equivalent SRM LCC parameter set. There is also an error in the line ordering in the NGA_3parDT/Set_A/Local_geodetic_201.csv file. The changes to those files are captured in Appendix E.
4. The computing platform where the test was conducted on 01 Jul 08 was located in the FCS Training Systems SIL in SAIC Science Bldg I, 12901 Science Drive, Orlando, FL, 32826. The computer name used was "DARLEK1".

Appendix A

NGA's gold data package (GoldData_v6.1) file organization structure is as follows:

```
GOLDDATA_V6.1
|    Instructions.rtf
|    Release_Notes.rtf
|
+---global_3D
|   |    global_3D_index.xls
|   |
|   +---SRMmax
|   |        ellipsoidal_110.csv
|   |        geodetic_106.csv
|   |        geodetic_Lat_first_107.c
|   |        rectangular_108.csv
|   |        spherical_109.csv
|   |
|   \---WGS84
|            ellipsoidal_105.csv
|            geodetic_101.csv
|            geodetic_Lat_first_102.c
|            rectangular_103.csv
|            spherical_104.csv
|
+---map_proj
|   |    map_proj_index.xls
|   |    Show_Lon_Lat_points.pdf
|   |
|   +---Sphere
|   |        Lat_Lon.csv
|   |        LCC_60.csv
|   |        LCC_60a.csv
|   |        LCC_61.csv
|   |        LCC_62.csv
|   |        LCC_62a.csv
|   |        LCC_63.csv
|   |        LCC_64.csv
|   |        LCC_65.csv
|   |        LCC_66.csv
|   |        LCC_67.csv
|   |        LCC_68.csv
|   |        LCC_69.csv
|   |        Lon_Lat.csv
|   |        Mercator_51.csv
|   |        Mercator_51a.csv
|   |        Mercator_52.csv
|   |        Mercator_53.csv
|   |        Mercator_54.csv
|   |        Mercator_54a.csv
|   |        Mercator_54b.csv
|   |        Ney_70.csv
|   |        Ney_71.csv
|   |        PolarStereo_55.csv
|   |        PolarStereo_55a.csv
|   |        PolarStereo_55b.csv
|   |        PolarStereo_56.csv
```

```
|   |       PolarStereo_57.csv
|   |       PolarStereo_57a.csv
|   |       PolarStereo_57b.csv
|   |       PolarStereo_58.csv
|   |       PolarStereo_58a.csv
|   |       PolarStereo_59.csv
|   |       PolarStereo_59a.csv
|   |       TransMerc_72.csv
|   |       TransMerc_72a.csv
|   |       TransMerc_73.csv
|   |
|   +---SRMmax
|   |       Lat_Lon.csv
|   |       LCC_37.csv
|   |       LCC_37a.csv
|   |       LCC_38.csv
|   |       LCC_39.csv
|   |       LCC_39a.csv
|   |       LCC_40.csv
|   |       LCC_41.csv
|   |       LCC_42.csv
|   |       LCC_43.csv
|   |       LCC_44.csv
|   |       LCC_45.csv
|   |       LCC_46.csv
|   |       Lon_Lat.csv
|   |       Mercator_28.csv
|   |       Mercator_28a.csv
|   |       Mercator_29.csv
|   |       Mercator_30.csv
|   |       Mercator_31.csv
|   |       Mercator_31a.csv
|   |       Mercator_31b.csv
|   |       Ney_47.csv
|   |       Ney_48.csv
|   |       PolarStereo_32.csv
|   |       PolarStereo_32a.csv
|   |       PolarStereo_32b.csv
|   |       PolarStereo_33.csv
|   |       PolarStereo_34.csv
|   |       PolarStereo_34a.csv
|   |       PolarStereo_34b.csv
|   |       PolarStereo_35.csv
|   |       PolarStereo_35a.csv
|   |       PolarStereo_36.csv
|   |       PolarStereo_36a.csv
|   |       TransMerc_49.csv
|   |       TransMerc_49a.csv
|   |       TransMerc_50.csv
|   |
|   \---WGS84
|           Lat_Lon.csv
|           LCC_14.csv
|           LCC_14a.csv
|           LCC_15.csv
|           LCC_16.csv
|           LCC_16a.csv
|           LCC_17.csv
```

```
|              LCC_18.csv
|              LCC_19.csv
|              LCC_20.csv
|              LCC_21.csv
|              LCC_22.csv
|              LCC_23.csv
|              Lon_Lat.csv
|              Mercator_5.csv
|              Mercator_5a.csv
|              Mercator_6.csv
|              Mercator_7.csv
|              Mercator_8.csv
|              Mercator_8a.csv
|              Mercator_8b.csv
|              Ney_24.csv
|              Ney_25.csv
|              PolarStereo_09.csv
|              PolarStereo_09a.csv
|              PolarStereo_09b.csv
|              PolarStereo_10.csv
|              PolarStereo_11.csv
|              PolarStereo_11a.csv
|              PolarStereo_11b.csv
|              PolarStereo_12.csv
|              PolarStereo_12a.csv
|              PolarStereo_13.csv
|              PolarStereo_13a.csv
|              TransMerc_26.csv
|              TransMerc_26a.csv
|              TransMerc_27.csv
|
\---NGA_3parDT
|       NGA_3parDT_index.xls
|
+---Set_A
|          Local_geodetic_201.csv
|          WGS84_geodetic_202.csv
|
\---Set_B
            Local_geodetic_203.csv
            WGS84_geodetic_204.csv
```

The gold data provides a set of comma separated value (csv) files, where each file specifies a coordinate reference frame along with the necessary parameters, and a set of coordinates within that reference frame. The gold data includes three broad categories of coordinate test data:
1. Map projection coordinate test data. (map_proj branch)
2. Three-dimensional coordinate test data. (global_3d branch)
3. Geodetic coordinate test data for various Earth model datums (NGA_3parDT branch)

For map projection and global 3D branches, each of their sub-branches group data files containing the coordinate values for a same set of coordinates in different spatial reference frames using the same datum. There are 300 coordinate values for the map

projection case and 600 coordinate values for the global 3D case.   For instance, in the map_proj/WGS84 branch, the lon_lat.csv file contains 300 locations specified as geodetic coordinates, while the TransMerc_27.csv contains the same 300 locations as coordinates in a Transverse Mercator (map projection) reference frame. Both reference frames use the WGS 1984 Earth model datum.

For the NGA_3parDT branch, there are two sub-branches including two files with 5000 geodetic coordinates each, with one file having all the geodetic coordinates based on the WGS 1984 and the other file containing the same 5000 locations in space, but associated with a geodetic reference frame using various Earth model datums other than WGS 1984.

The gold data also includes documentation describing an overview of its content.

APPENDIX B

The content of the test_accuracy_config_all.csv file is as follows:

```
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_14.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_14a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_15.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_16.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_16a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_17.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_18.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_19.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_20.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_21.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_22.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,LCC_23.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_5.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_5a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_6.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_7.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_8.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_8a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Mercator_8b.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Ney_24.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,Ney_25.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_09.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_09a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_09b.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_10.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_11.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_11a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_11b.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_12.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_12a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_13.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,PolarStereo_13a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,TransMerc_26.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,TransMerc_26a.csv
GoldData_v6.1/map_proj/WGS84/,Lon_Lat.csv,TransMerc_27.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_37.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_37a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_38.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_39.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_39a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_40.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_41.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_42.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_43.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_44.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_45.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,LCC_46.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_28.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_28a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_29.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_30.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_31.csv
```

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GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_31a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Mercator_31b.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Ney_48.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,Ney_47.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_32.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_32a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_32b.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_33.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_34.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_34a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_34b.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_35.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_35a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_36.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,PolarStereo_36a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,TransMerc_49.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,TransMerc_49a.csv
GoldData_v6.1/map_proj/SRMmax/,Lon_Lat.csv,TransMerc_50.csv
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GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_60a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_61.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_62.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_62a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_63.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_64.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_65.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_66.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_67.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_68.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,LCC_69.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_51.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_51a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_52.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_53.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_54.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_54a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Mercator_54b.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Ney_71.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,Ney_70.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_55.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_55a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_55b.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_56.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_57.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_57a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_57b.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_58.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_58a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_59.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,PolarStereo_59a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,TransMerc_72.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,TransMerc_72a.csv
GoldData_v6.1/map_proj/Sphere/,Lon_Lat.csv,TransMerc_73.csv
GoldData_v6.1/global_3D/WGS84/,geodetic_101.csv,rectangular_103.csv
GoldData_v6.1/global_3D/WGS84/,geodetic_101.csv,spherical_104.csv
GoldData_v6.1/global_3D/WGS84/,geodetic_101.csv,ellipsoidal_105.csv
GoldData_v6.1/global_3D/SRMmax/,geodetic_106.csv,rectangular_108.csv
```

```
GoldData_v6.1/global_3D/SRMmax/,geodetic_106.csv,spherical_109.csv
GoldData_v6.1/global_3D/SRMmax/,geodetic_106.csv,ellipsoidal_110.csv
GoldData_v6.1/NGA_3parDT/Set_A/,Local_geodetic_201.csv,WGS84_geodetic_202.csv
GoldData_v6.1/NGA_3parDT/Set_B/,WGS84_geodetic_204.csv,Local_geodetic_203.csv
```

Appendix C

A sample accuracy assessment output srm_conv_accuracy_results.csv file is as follows:

Note: These files can be viewed in MS Excel in a tabular form. You may cut and paste the following into an ASCII test file with extension ".csv", and from there, load into Excel.

```
Coordinate conversion accuracy assessment for SRM C++ 4.3
(The results are given as the Euclidean distance (in meters) between the computed
coordinate and the gold data)

Test conducted: Wed Jun 25 09:58:35 2008

ORM/RT, Conversion, Count, MIN (m), MAX (m)

WGE, Lon_Lat.csv to LCC_14.csv, 300, 4.3930397983904e-008, 1.03190621959572e-005
WGE, LCC_14.csv to Lon_Lat.csv, 300, 3.49560439936265e-008, 1.24937044102701e-005
WGE, Lon_Lat.csv to LCC_14a.csv, 300, 4.65661287307739e-008, 0.0485254914475023
WGE, LCC_14a.csv to Lon_Lat.csv, 300, 1.00069251178863e-006, 0.00898214764877519
WGE, Lon_Lat.csv to LCC_15.csv, 300, 7.30355248611219e-005, 0.00664613155240192
WGE, LCC_15.csv to Lon_Lat.csv, 300, 1.0284373776686e-005, 0.00945956664182126
WGE, Lon_Lat.csv to LCC_16.csv, 300, 3.5255203453354e-008, 2.45155000351608e-005
WGE, LCC_16.csv to Lon_Lat.csv, 300, 0, 1.25115230455474e-005
WGE, Lon_Lat.csv to LCC_16a.csv, 300, 2.20636981362144e-008, 2.45654229393535e-005
WGE, LCC_16a.csv to Lon_Lat.csv, 300, 5.32964690989503e-008, 1.25542277928617e-005
WGE, Lon_Lat.csv to LCC_17.csv, 300, 8.33000234328132e-009, 2.8117780703377e-006
WGE, LCC_17.csv to Lon_Lat.csv, 300, 1.41623091030368e-009, 1.21358793240946e-005
WGE, Lon_Lat.csv to LCC_18.csv, 300, 5.66903088064723e-005, 0.0107708494103355
WGE, LCC_18.csv to Lon_Lat.csv, 300, 4.74007611481407e-006, 0.000216296817328449
WGE, Lon_Lat.csv to LCC_19.csv, 300, 4.50551360010351e-008, 2.88336157733516e-006
WGE, LCC_19.csv to Lon_Lat.csv, 300, 2.84195548410481e-009, 1.29002225001415e-005
WGE, Lon_Lat.csv to LCC_20.csv, 300, 1.32644007987903e-007, 0.000310699666542567
WGE, LCC_20.csv to Lon_Lat.csv, 300, 1.55785400133405e-008, 1.19909643732123e-005
WGE, Lon_Lat.csv to LCC_21.csv, 300, 2.27839541853074e-006, 0.059845581565247
WGE, LCC_21.csv to Lon_Lat.csv, 300, 2.35574989449233e-006, 0.00250128106958158
WGE, Lon_Lat.csv to LCC_22.csv, 300, 0.00712329229267342, 0.0220999677618538
WGE, LCC_22.csv to Lon_Lat.csv, 300, 1.27764408034037e-007, 0.000217996382087533
WGE, Lon_Lat.csv to LCC_23.csv, Exception: Incompatible SRF Parameter Set
WGE, LCC_23.csv to Lon_Lat.csv, Exception: Incompatible SRF Parameter Set
WGE, Lon_Lat.csv to Mercator_5.csv, 300, 5.68944960832596e-006, 0.000889730736278927
WGE, Mercator_5.csv to Lon_Lat.csv, 300, 0, 1.21723992758586e-005
WGE, Lon_Lat.csv to Mercator_5a.csv, 300, 5.68851828575134e-006, 0.000889733529813024
WGE, Mercator_5a.csv to Lon_Lat.csv, 300, 0, 1.21723537268119e-005
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WGE, Mercator_6.csv to Lon_Lat.csv, 300, 0, 1.20150911592185e-005
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WGE, Mercator_7.csv to Lon_Lat.csv, 300, 0, 1.23205701746336e-005
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WGE, Mercator_8.csv to Lon_Lat.csv, 300, 0, 1.21742965875402e-005
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WGE, Mercator_8a.csv to Lon_Lat.csv, 300, 0, 1.20137961906253e-005
WGE, Lon_Lat.csv to Mercator_8b.csv, 300, 4.34425006078347e-006, 0.000771384699220933
WGE, Mercator_8b.csv to Lon_Lat.csv, 300, 0, 1.20124065799497e-005
WGE, Lon_Lat.csv to Ney_24.csv, Ney SRF not supported
WGE, Ney_24.csv to Lon_Lat.csv, Ney SRF not supported
```

```
WGE, Lon_Lat.csv to Ney_25.csv, Ney SRF not supported
WGE, Ney_25.csv to Lon_Lat.csv, Ney SRF not supported
WGE, Lon_Lat.csv to PolarStereo_09.csv, 252, 3.08487919021495e-006,
0.000593962147831917
WGE, PolarStereo_09.csv to Lon_Lat.csv, 222, 5.68354450217515e-009,
1.25207627983441e-005
WGE, Lon_Lat.csv to PolarStereo_09a.csv, 252, 3.08487919021495e-006,
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WGE, PolarStereo_09a.csv to Lon_Lat.csv, 222, 5.68354450217515e-009,
1.25207627983441e-005
WGE, Lon_Lat.csv to PolarStereo_09b.csv, 252, 1.71464986118016e-006,
0.00041587371379137
WGE, PolarStereo_09b.csv to Lon_Lat.csv, 207, 5.68354450217515e-009,
1.25735358362838e-005
WGE, Lon_Lat.csv to PolarStereo_10.csv, 252, 2.61761368897605e-006,
0.000554230064153671
WGE, PolarStereo_10.csv to Lon_Lat.csv, 218, 2.04491907860038e-008,
1.26319046745504e-005
WGE, Lon_Lat.csv to PolarStereo_11.csv, 252, 3.13126695236495e-006,
0.000593868950151787
WGE, PolarStereo_11.csv to Lon_Lat.csv, 222, 5.68354450217515e-009,
1.24838314071052e-005
WGE, Lon_Lat.csv to PolarStereo_11a.csv, 252, 2.58684616047907e-006,
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WGE, PolarStereo_11a.csv to Lon_Lat.csv, 217, 4.54410718675068e-008,
1.23673291029248e-005
WGE, Lon_Lat.csv to PolarStereo_11b.csv, 252, 2.5867974057413e-006,
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WGE, PolarStereo_11b.csv to Lon_Lat.csv, 217, 4.40210383716472e-008,
1.23673291029248e-005
WGE, Lon_Lat.csv to PolarStereo_12.csv, 252, 3.11050621885369e-006,
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WGE, PolarStereo_12.csv to Lon_Lat.csv, 222, 5.68354450217515e-009,
1.25207627983441e-005
WGE, Lon_Lat.csv to PolarStereo_12a.csv, 252, 2.64176203624273e-006,
0.000554300844669342
WGE, PolarStereo_12a.csv to Lon_Lat.csv, 218, 2.04583993721597e-008,
1.26347197608437e-005
WGE, Lon_Lat.csv to PolarStereo_13.csv, 111, 1.98936964798464e-005,
0.000593829203242181
WGE, PolarStereo_13.csv to Lon_Lat.csv, 81, 5.68354450217515e-009, 1.15713440730081e-
005
WGE, Lon_Lat.csv to PolarStereo_13a.csv, 111, 1.84684928866687e-005,
0.000554335498995751
WGE, PolarStereo_13a.csv to Lon_Lat.csv, 76, 4.90488615570422e-008,
1.17314952284449e-005
WGE, Lon_Lat.csv to TransMerc_26.csv, 66, 2.84006076064948e-010, 0.000267375347903085
WGE, TransMerc_26.csv to Lon_Lat.csv, 66, 2.85436789319599e-010, 0.000190458064180728
WGE, Lon_Lat.csv to TransMerc_26a.csv, 66, 1.532267380387e-007, 0.000267375622558535
WGE, TransMerc_26a.csv to Lon_Lat.csv, 64, 3.83140637555062e-007,
0.000190073497145352
WGE, Lon_Lat.csv to TransMerc_27.csv, 71, 1.00675970315933e-006, 0.000438463757746003
WGE, TransMerc_27.csv to Lon_Lat.csv, 71, 8.00174958423453e-008, 0.000180355782610913
Test_SRMmax, Lon_Lat.csv to LCC_37.csv, 300, 3.9731051925366e-008, 9.85375831954678e-
006
Test_SRMmax, LCC_37.csv to Lon_Lat.csv, 300, 2.31663510935513e-008,
0.000381471110865589
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Test_SRMmax, Lon_Lat.csv to LCC_37a.csv, 300, 4.65661287307739e-008, 0.0401512034695211
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Test_SRMmax, Lon_Lat.csv to LCC_38.csv, 300, 2.52956713766325e-006, 0.00662580777350205
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Test_SRMmax, Lon_Lat.csv to LCC_39.csv, 300, 3.17879918327108e-008, 2.54439596365702e-005
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Test_SRMmax, Lon_Lat.csv to LCC_39a.csv, 300, 3.35793129677324e-009, 2.56787186768267e-005
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Test_SRMmax, LCC_43.csv to Lon_Lat.csv, 300, 1.42202970324846e-008, 0.000381063030310385
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Test_SRMmax, LCC_45.csv to Lon_Lat.csv, 300, 6.25379996108334e-007, 0.000477747507327764
Test_SRMmax, Lon_Lat.csv to LCC_46.csv, Exception: Incompatible SRF Parameter Set
Test_SRMmax, LCC_46.csv to Lon_Lat.csv, Exception: Incompatible SRF Parameter Set
Test_SRMmax, Lon_Lat.csv to Mercator_28.csv, 300, 0.000211504413986261, 0.0529030747771642
Test_SRMmax, Mercator_28.csv to Lon_Lat.csv, 300, 0, 0.000380789435076393
Test_SRMmax, Lon_Lat.csv to Mercator_28a.csv, 300, 0.000211503356695175, 0.0529030710463556
Test_SRMmax, Mercator_28a.csv to Lon_Lat.csv, 300, 0, 0.000380789435076393
Test_SRMmax, Lon_Lat.csv to Mercator_29.csv, 300, 0.000183473218475712, 0.0458918958926174
Test_SRMmax, Mercator_29.csv to Lon_Lat.csv, 300, 0, 0.000381102261885513
Test_SRMmax, Lon_Lat.csv to Mercator_30.csv, 300, 0.000148053089790383, 0.037032753229939
Test_SRMmax, Mercator_30.csv to Lon_Lat.csv, 300, 0, 0.000381204179223797
Test_SRMmax, Lon_Lat.csv to Mercator_31.csv, 300, 0.000211504413986261, 0.0529030747733655
Test_SRMmax, Mercator_31.csv to Lon_Lat.csv, 300, 0, 0.000380789662435794
Test_SRMmax, Lon_Lat.csv to Mercator_31a.csv, 300, 0.000183473218475712, 0.0458918958912901
Test_SRMmax, Mercator_31a.csv to Lon_Lat.csv, 300, 0, 0.000381102062462656

Test_SRMmax, Lon_Lat.csv to Mercator_31b.csv, 300, 0.000183474272489548, 0.0458918958912901
Test_SRMmax, Mercator_31b.csv to Lon_Lat.csv, 300, 0, 0.000381100483145287
Test_SRMmax, Lon_Lat.csv to Ney_48.csv, Ney SRF not supported
Test_SRMmax, Ney_48.csv to Lon_Lat.csv, Ney SRF not supported
Test_SRMmax, Lon_Lat.csv to Ney_47.csv, Ney SRF not supported
Test_SRMmax, Ney_47.csv to Lon_Lat.csv, Ney SRF not supported
Test_SRMmax, Lon_Lat.csv to PolarStereo_32.csv, 252, 0.000419197672253563, 0.0258558383211493
Test_SRMmax, PolarStereo_32.csv to Lon_Lat.csv, 209, 4.69052628639038e-008, 0.00038151239272577
Test_SRMmax, Lon_Lat.csv to PolarStereo_32a.csv, 252, 0.000419197672253563, 0.025855838728603
Test_SRMmax, PolarStereo_32a.csv to Lon_Lat.csv, 209, 4.69052628639038e-008, 0.000381512392725 77
Test_SRMmax, Lon_Lat.csv to PolarStereo_32b.csv, 252, 0.000293187313380958, 0.0180987874045968
Test_SRMmax, PolarStereo_32b.csv to Lon_Lat.csv, 224, 1.17067171846081e-007, 0.000381296508482604
Test_SRMmax, Lon_Lat.csv to PolarStereo_33.csv, 252, 0.000391141453155978, 0.0241265594959259
Test_SRMmax, PolarStereo_33.csv to Lon_Lat.csv, 215, 4.47280576117359e-008, 0.000381295038154911
Test_SRMmax, Lon_Lat.csv to PolarStereo_34.csv, 252, 0.000419292107276018, 0.0258554814719444
Test_SRMmax, PolarStereo_34.csv to Lon_Lat.csv, 212, 4.69052628639038e-008, 0.000381506752136568
Test_SRMmax, Lon_Lat.csv to PolarStereo_34a.csv, 252, 0.000391192585067766, 0.0241268068875943
Test_SRMmax, PolarStereo_34a.csv to Lon_Lat.csv, 211, 4.45187478651762e-008, 0.00038144001542608
Test_SRMmax, Lon_Lat.csv to PolarStereo_34b.csv, 252, 0.000391192596210981, 0.0241268069471143
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Test_SRMmax, PolarStereo_35.csv to Lon_Lat.csv, 209, 4.69052628639038e-008, 0.000381512393391594
Test_SRMmax, Lon_Lat.csv to PolarStereo_35a.csv, 252, 0.000391224440113484, 0.0241265930235386
Test_SRMmax, PolarStereo_35a.csv to Lon_Lat.csv, 215, 4.43198423644104e-008, 0.000381295038154911
Test_SRMmax, Lon_Lat.csv to PolarStereo_36.csv, 111, 0.000419254768020084, 0.021778890388896
Test_SRMmax, PolarStereo_36.csv to Lon_Lat.csv, 71, 4.69052628639038e-008, 0.000353769370532931
Test_SRMmax, Lon_Lat.csv to PolarStereo_36a.csv, 111, 0.000391153251395546, 0.0203222285279267
Test_SRMmax, PolarStereo_36a.csv to Lon_Lat.csv, 70, 4.54969341130958e-008, 0.000353837632266746
Test_SRMmax, Lon_Lat.csv to TransMerc_49.csv, 66, 5.64884257905767e-010, 0.000637112185359001
Test_SRMmax, TransMerc_49.csv to Lon_Lat.csv, 66, 5.70551786294043e-010, 0.00276694164617706
Test_SRMmax, Lon_Lat.csv to TransMerc_49a.csv, 66, 4.30736690759659e-008, 0.000637069344520569

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Test_SRMmax, TransMerc_49a.csv to Lon_Lat.csv, 64, 4.06982792571014e-008,
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Test_sphere, Lon_Lat.csv to LCC_60a.csv, 300, 4.65661287307739e-008,
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Test_sphere, LCC_60a.csv to Lon_Lat.csv, 300, 1.41357985842823e-009,
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Test_sphere, Lon_Lat.csv to LCC_62a.csv, 300, 2.51628325015469e-008,
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Test_sphere, LCC_62a.csv to Lon_Lat.csv, 300, 7.06789929214115e-010,
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Test_sphere, LCC_69.csv to Lon_Lat.csv, Exception: Incompatible SRF Parameter Set
Test_sphere, Lon_Lat.csv to Mercator_51.csv, 300, 1.11758708953857e-008,
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Test_sphere, Lon_Lat.csv to Mercator_52.csv, 300, 3.25962901115417e-008,
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Test_sphere, Mercator_52.csv to Lon_Lat.csv, 300, 0, 6.09661764990871e-007
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Test_sphere, Ney_71.csv to Lon_Lat.csv, Ney SRF not supported
Test_sphere, Lon_Lat.csv to Ney_70.csv, Ney SRF not supported
Test_sphere, Ney_70.csv to Lon_Lat.csv, Ney SRF not supported
Test_sphere, Lon_Lat.csv to PolarStereo_55.csv, 252, 0, 1.53411140153789e-006
Test_sphere, PolarStereo_55.csv to Lon_Lat.csv, 223, 1.41357985842823e-009, 5.90510148157952e-007
Test_sphere, Lon_Lat.csv to PolarStereo_55a.csv, 252, 0, 1.53367989199901e-006
Test_sphere, PolarStereo_55a.csv to Lon_Lat.csv, 223, 1.41357985842823e-009, 5.89225158488262e-007
Test_sphere, Lon_Lat.csv to PolarStereo_55b.csv, 252, 1.62981450557709e-009, 1.12561974674463e-006
Test_sphere, PolarStereo_55b.csv to Lon_Lat.csv, 230, 3.6753076319134e-008, 8.84277910477777e-007
Test_sphere, Lon_Lat.csv to PolarStereo_56.csv, 252, 5.58793544769287e-009, 1.54980807565153e-006
Test_sphere, PolarStereo_56.csv to Lon_Lat.csv, 219, 6.71450432753409e-009, 6.87940544355078e-007
Test_sphere, Lon_Lat.csv to PolarStereo_57.csv, 252, 3.1237508787305e-009, 1.00760229313804e-006
Test_sphere, PolarStereo_57.csv to Lon_Lat.csv, 226, 4.06168096074863e-008, 6.38352861399537e-007
Test_sphere, Lon_Lat.csv to PolarStereo_57a.csv, 252, 1.01863406598568e-008, 1.26955914886279e-006
Test_sphere, PolarStereo_57a.csv to Lon_Lat.csv, 220, 3.72676320917817e-008, 6.87954355513313e-007
Test_sphere, Lon_Lat.csv to PolarStereo_57b.csv, 252, 1.02445483207703e-008, 1.26948286011266e-006
Test_sphere, PolarStereo_57b.csv to Lon_Lat.csv, 220, 3.72676320917817e-008, 6.87761099580543e-007
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Test_sphere, PolarStereo_58.csv to Lon_Lat.csv, 223, 1.41357985842823e-009, 5.9054188846257e-007
Test_sphere, Lon_Lat.csv to PolarStereo_58a.csv, 252, 9.31322574615479e-009, 1.55065208673477e-006
Test_sphere, PolarStereo_58a.csv to Lon_Lat.csv, 219, 6.71450432753409e-009, 6.87719715705118e-007
Test_sphere, Lon_Lat.csv to PolarStereo_59.csv, 111, 1.74000993292158e-008, 9.57941667805879e-007
Test_sphere, PolarStereo_59.csv to Lon_Lat.csv, 85, 4.06168096074863e-008, 5.57902464033805e-007
Test_sphere, Lon_Lat.csv to PolarStereo_59a.csv, 111, 1.49011611938477e-008, 1.1116356136608e-006

Test_sphere, PolarStereo_59a.csv to Lon_Lat.csv, 79, 5.5129614478701e-008, 6.89715155228241e-007
Test_sphere, Lon_Lat.csv to TransMerc_72.csv, 66, 1.16218487640948e-007, 5.63410920975438e-007
Test_sphere, TransMerc_72.csv to Lon_Lat.csv, 66, 1.41357985842823e-009, 8.72255499434866e-005
Test_sphere, Lon_Lat.csv to TransMerc_72a.csv, 66, 3.1978802839534e-008, 5.9502908560011e-007
Test_sphere, TransMerc_72a.csv to Lon_Lat.csv, 64, 1.41357985842823e-008, 8.72065624766737e-005
Test_sphere, Lon_Lat.csv to TransMerc_73.csv, 71, 6.05035246763156e-008, 8.19529345476624e-007
Test_sphere, TransMerc_73.csv to Lon_Lat.csv, 71, 1.0813885916976e-007, 0.000495939578571915
WGE, geodetic_101.csv to rectangular_103.csv, 465, 1.47773920917936e-007, 0.000101433130052283
WGE, rectangular_103.csv to geodetic_101.csv, 451, 0, 0.000878061633994873
WGE, geodetic_101.csv to spherical_104.csv, Spherical SRF not supported
WGE, spherical_104.csv to geodetic_101.csv, Spherical SRF not supported
WGE, geodetic_101.csv to ellipsoidal_105.csv, Ellipsoidal SRF not supported
WGE, ellipsoidal_105.csv to geodetic_101.csv, Ellipsoidal SRF not supported
Test_SRMmax, geodetic_106.csv to rectangular_108.csv, 465, 1.19290585316948e-007, 0.00159103050874449
Test_SRMmax, rectangular_108.csv to geodetic_106.csv, 449, 0, 0.0141402706503869
Test_SRMmax, geodetic_106.csv to spherical_109.csv, Spherical SRF not supported
Test_SRMmax, spherical_109.csv to geodetic_106.csv, Spherical SRF not supported
Test_SRMmax, geodetic_106.csv to ellipsoidal_110.csv, Ellipsoidal SRF not supported
Test_SRMmax, ellipsoidal_110.csv to geodetic_106.csv Ellipsoidal SRF not supported

Appendix D

A sample accuracy assessment output srm_datum_accuracy_results.csv file is as follows:

Note: These files can be viewed in MS Excel in a tabular form. You may cut and paste the following into an ASCII test file with extension ".csv", and from there, load into Excel.

```
Datum conversion accuracy assessment for SRM C++ 4.3
(The results are given as the Euclidean distance (in meters) between the
computed coordinate and the gold data)

Test conducted: Wed Jun 25 09:58:35 2008

Src ORM, Tgt ORM, Count, MIN (m), MAX (m)

ADI-M, WGE, 63, 8.53482834778243e-005, 0.000684794025855462
ADI-A, WGE, 25, 0.000105869212791717, 0.000649439183311397
ADI-B, WGE, 63, 5.79789479334134e-005, 0.000723187539449374
ADI-C, WGE, 25, 0.000144617845158476, 0.00065220103845651
ADI-D, WGE, 25, 0.000137210658688357, 0.000688068315707844
ADI-E, WGE, 25, 0.000183871177698355, 0.000711967586058017
ADI-F, WGE, 25, 3.42482206188252e-005, 0.000759040794003536
AFG, WGE, 42, 0.0001142325238321, 0.000728725012330328
AIA, WGE, 4, 0.000240846327600401, 0.000513322113202536
AIN-A, WGE, 4, 0.000283328358896137, 0.000527836218703765
AIN-B, WGE, 63, 9.47155455725548e-005, 0.000700950150624384
AMA, WGE, 9, 0.000260401306694595, 0.000705106629580444
ANO, WGE, 9, 0.000258595970091232, 0.000727018283424189
ARF-M, WGE, 81, 5.21662214311581e-005, 0.000735907679517239
ARF-A, WGE, 25, 0.000180725408762206, 0.000681688885792637
ARF-B, WGE, 9, 0.000138407818754077, 0.000637434071935685
ARF-C, WGE, 15, 7.69353986064306e-005, 0.000617219724687299
ARF-D, WGE, 12, 0.00022559943899655, 0.000593523770849389
ARF-E, WGE, 25, 8.43136497076124e-005, 0.000699902268419647
ARF-F, WGE, 30, 9.76516137302036e-005, 0.000683657938905388
ARF-G, WGE, 25, 0.000140659470561947, 0.000579546042190806
ARF-H, WGE, 20, 0.000185895238732357, 0.0006996939804098
ARS-M, WGE, 25, 0.00017942249711705, 0.000594493436922239
ARS-A, WGE, 25, 5.56233327911203e-005, 0.000719710620029538
ARS-B, WGE, 25, 0.000136056355087104, 0.000668853371221885
ASC, WGE, 4, 8.92900495825326e-005, 0.000337895439549552
ASM, WGE, 4, 0.000377988567304506, 0.000548306646905164
ASQ, WGE, 4, 0.000329199624069217, 0.000603598321105801
ATF, WGE, 4, 0.00031105579523321, 0.0005238800106655
AUA, WGE, 81, 8.59962951137982e-005, 0.000706681689828524
AUG, WGE, 81, 0.000127008757798357, 0.000757049986180332
BAT, WGE, 91, 9.4655697253664e-005, 0.000756555964170997
BID, WGE, 25, 7.0559157517937e-005, 0.000714765408706571
BER, WGE, 4, 0.000376576423406989, 0.000669783068406664
BOO, WGE, 20, 0.00178135910296264, 0.000665623241206696
BUR, WGE, 9, 0.00021732097528125, 0.000679871762985266
CAC, WGE, 45, 2.67754004743137e-005, 0.000658795154315392
CAI, WGE, 35, 9.69147533823896e-005, 0.000637817210637768
CAO, WGE, 20, 0, 0.000770879448032731
CAP, WGE, 30, 0.000144853732590523, 0.000696965400999164
CAZ, WGE, 24, 6.82119524919458e-005, 0.00054050621568625
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CCD, WGE, 15, 0.000112752027196039, 0.000525312431976338
CGE, WGE, 25, 0.000102039208557214, 0.000665825510585806
CHI, WGE, 9, 0, 0.000563186523306158
CHU, WGE, 25, 6.74800046661727e-005, 0.000677263254786291
COA, WGE, 63, 7.44910598612308e-005, 0.000732991229792425
DAL, WGE, 12, 0.000115375770033492, 0.000708499242717393
DID, WGE, 4, 8.57069841707881e-005, 0.000516083869771412
DOB, WGE, 4, 0.000328074213011248, 0.00054967412112793
EAS, WGE, 4, 6.1658932393854e-005, 0.000614668128967747
ENW, WGE, 12, 6.99725712992829e-005, 0.000661109887768964
EST, WGE, 12, 0.000112462589317352, 0.00052172391757494
EUR-M, WGE, 55, 5.42197010706884e-005, 0.000633676435368288
EUR-A, WGE, 117, 3.52089219684744e-005, 0.000616848925140719
EUR-B, WGE, 35, 6.66309928770263e-005, 0.000630598594636395
EUR-C, WGE, 25, 6.77822999458347e-005, 0.000539171752528883
EUR-D, WGE, 30, 0.000122530147658872, 0.000653757654053248
EUR-E, WGE, 4, 0.000189975034565023, 0.00044567862039257
EUR-F, WGE, 25, 0.000150740263820446, 0.000611450882261435
EUR-G, WGE, 9, 0.000114807800052287, 0.0005223903028465
EUR-H, WGE, 25, 0.000103883923063546, 0.000663375961323414
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EUR-J, WGE, 9, 0.000281182006581855, 0.000625254218974776
EUR-K, WGE, 12, 0.000114807800052287, 0.000574084816650084
EUR-L, WGE, 4, 0.000411842263743718, 0.000535084470076117
EUR-S, WGE, 35, 0.000143935504060055, 0.000709842095973375
EUR-T, WGE, 25, 7.63837021475411e-005, 0.000707446284671715
EUS, WGE, 77, 9.2590110802433e-005, 0.000650169483292201
FAH, WGE, 25, 0.000134851586593575, 0.000602928257647751
FLO, WGE, 4, 0.000222636519967007, 0.000608488676012927
FOT, WGE, 4, 0.000207017006836397, 0.00062778169571762
GAA, WGE, 6, 0.000244440246243386, 0.000586874660544884
GEO, WGE, 16, 0.000207049994361501, 0.00069242603548384
GIZ, WGE, 4, 0.000188270615356461, 0.000525620027695499
GRA, WGE, 4, 0.000328078341680464, 0.000553331258722857
GUA, WGE, 4, 0.000309858835438289, 0.000516364667294522
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HEN, WGE, 25, 0.00010916005984751, 0.000683209292520733
HER, WGE, 15, 6.80539514851931e-005, 0.00064190510655302
HIT, WGE, 45, 7.21508983237587e-005, 0.00069311423578083
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HKD, WGE, 6, 0.000264466557707718, 0.000619738847751661
HTN, WGE, 9, 0.000304386349391583, 0.000680665012546732
IBE, WGE, 4, 0.000366714096198744, 0.000565923304528146
IDN, WGE, 36, 3.91850924474543e-005, 0.000714458450408677
IND-B, WGE, 20, 0.000143135312182181, 0.000560521872291734
IND-I, WGE, 35, 0.000108820817725928, 0.000681125677210297
IND-P, WGE, 35, 6.93454391277418e-005, 0.000669581788459123
INF-A, WGE, 35, 0.0001697317724436, 0.00077569885024991
ING-A, WGE, 15, 0.000221211859399246, 0.000530753896422263
ING-B, WGE, 4, 0.000277285334978323, 0.000718957815063897
INH-A, WGE, 20, 5.15096818323262e-005, 0.000608820715330811
INH-A1, WGE, 20, 0.00017549953488816, 0.000683591053914874
IRL, WGE, 6, 0.000235651763708524, 0.000568136870425771
ISG, WGE, 4, 0.00036227295587067, 0.000508839209673342
IST, WGE, 9, 0.000325315464607068, 0.000696315676034577
JOH, WGE, 6, 0.000269909430072831, 0.000589799570308492
KAN, WGE, 9, 7.12686954521292e-005, 0.000567779245853865
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KEG, WGE, 8, 0.000295978544710364, 0.000520013283366359
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KUS, WGE, 15, 0.000205681325070388, 0.000690931910792234
LCF, WGE, 4, 8.58932252219336e-005, 0.000448797632022427
LEH, WGE, 20, 0.000109726293106473, 0.000656149594431696
LIB, WGE, 20, 4.61446649850831e-005, 0.000762045327448522
LUZ-A, WGE, 15, 0.000133002635843841, 0.000604108662430422
LUZ-B, WGE, 9, 0.000190718996695532, 0.000745485696906126
MAS, WGE, 20, 0.000112542573254702, 0.000675912140375032
MER, WGE, 25, 8.3540890635297e-005, 0.000682626797599417
MID, WGE, 6, 0, 0.000650307563081876
MIK, WGE, 4, 0.000476970127100119, 0.000613457238808841
MIN-A, WGE, 25, 0.000101389117339056, 0.000665795329460025
MIN-B, WGE, 25, 2.44254978020457e-005, 0.000638669069547925
MOD, WGE, 9, 0.000149804631528258, 0.000597967467315108
MPO, WGE, 12, 0.000103575907578717, 0.000635425333791438
MVS, WGE, 4, 0.000288626520336691, 0.000600673674399154
NAH-A, WGE, 4, 0.000128228107559419, 0.000579838146594048
NAH-B, WGE, 20, 0.000109828012363525, 0.000640343994105618
NAH-C, WGE, 63, 8.00369650674565e-005, 0.00071807529816343
NAP, WGE, 4, 0.000266111801818283, 0.000607921340453797
NAR-A, WGE, 20, 6.67502941344795e-005, 0.000120284010836361
NAR-B, WGE, 24, 0, 0.000127343353986759
NAR-C, WGE, 16, 5.32010677409758e-005, 0.00012825680784736
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WGE, PIT, 12, 4.96971405828356e-005, 0.000650316130968614
WGE, PLN, 6, 6.60477538829572e-005, 0.000547817582116612
WGE, POS, 6, 0.000218506748043226, 0.000607865940790986
WGE, PRP-A, 25, 0.000115419170122686, 0.000705388546053293
WGE, PRP-B, 45, 6.15998072957346e-005, 0.000717776644441416
WGE, PRP-C, 45, 0.000152761346104966, 0.000653138801644602
WGE, PRP-D, 25, 9.85339085154735e-005, 0.000743550484325476
WGE, PRP-E, 16, 6.41681238833428e-005, 0.000658739124112394
WGE, PRP-F, 20, 8.14586017431888e-005, 0.000721800564747554
WGE, PRP-G, 25, 4.14071958017231e-005, 0.000630136011212198
WGE, PRP-H, 30, 0.00015506728358617, 0.000750907728267011
WGE, PRP-M, 45, 8.81537979752558e-005, 0.000643473321965607
WGE, PTB, 27, 0.000176763305117527, 0.000746233716697834
WGE, PTN, 20, 6.10959606204449e-005, 0.00067542784855703
WGE, PUK, 198, 0, 0.000634126307323697
WGE, PUR, 9, 8.37957007718936e-005, 0.0006691683620618064
WGE, QAT, 12, 9.60873400318364e-005, 0.000698613192398033
WGE, QUO, 55, 4.84377051351454e-005, 0.00055935477631236
WGE, REU, 16, 0.000119363704478912, 0.000712868766127348
WGE, SAE, 16, 5.57853820959614e-005, 0.000537752680866026
WGE, SAO, 4, 0.000166002394393811, 0.000641650534143188
WGE, SAP, 9, 0.000189246163091935, 0.000538580100563081
WGE, SAN-M, 56, 7.48047983259737e-005, 0.000626801724784132
WGE, SAN-A, 40, 8.3230756827441e-005, 0.000634064930508107
WGE, SAN-B, 25, 0.000129757146186419, 0.000670319529813515
WGE, SAN-C, 49, 0.000104214800263595, 0.000756439566795787
WGE, SAN-D, 45, 7.62811523837954e-005, 0.000659898076268727
WGE, SAN-E, 25, 0.000123719287878404, 0.00059782678070203
WGE, SAN-F, 16, 0.000154994643172008, 0.000677014684148906
WGE, SAN-G, 20, 8.74011058724939e-005, 0.00074154217382866
WGE, SAN-H, 25, 5.00639341357245e-005, 0.000628280445510781
WGE, SAN-I, 25, 7.36212672587569e-005, 0.000701534141502246
WGE, SAN-J, 4, 0.000123035856465539, 0.000489468465500211
WGE, SAN-K, 9, 0.0002320037743642, 0.000617073268570584
WGE, SAN-L, 30, 0.000132323161608302, 0.000677414201503246
WGE, SCK, 25, 4.53823811053926e-005, 0.000721841446837876
WGE, SGM, 4, 0.000283056802122847, 0.00062421426437874
WGE, SHB, 4, 0.000257778686248323, 0.000535012995280803
WGE, SOA, 4, 0.000442171369027587, 0.000744444116407635
WGE, SPK-A, 12, 0.000157743550276786, 0.000438078052064491
WGE, SPK-B, 15, 0.000112336593917938, 0.000587415075710645
WGE, SPK-C, 15, 0.000106219925193243, 0.000638223395715249
WGE, SPK-D, 9, 0.00010175489924711, 0.000551257037260293
WGE, SPK-E, 36, 9.88959091266816e-005, 0.000588379313629153
WGE, SPK-F, 9, 0.000146858466013788, 0.000573998570832085
WGE, SPK-G, 25, 0.000100478524726637, 0.000601282541548002
WGE, SRL, 16, 0.000201525797457385, 0.000630874104736024
WGE, TAN, 15, 8.71280421530551e-005, 0.00067641634437494
WGE, TDC, 4, 0.000195001848342871, 0.000590274748735089
WGE, TIL, 25, 3.35338807800704e-005, 0.000588566991399642
WGE, TOY-A, 25, 5.41770379040165e-005, 0.000633603367119386
```

```
WGE, TOY-B, 20, 0.000211329641199272, 0.000602438692742127
WGE, TOY-B1, 20, 0.000143585271315407, 0.000646773667786607
WGE, TOY-C, 16, 7.56740391538856e-005, 0.000684493110846273
WGE, TOY-M, 36, 0.000153444600816333, 0.000645985184093849
WGE, TRN, 4, 8.84108217011204e-005, 0.000529462166735195
WGE, VOI, 30, 0.000125903402648854, 0.000637343696453944
WGE, VOR, 30, 0.000105510571150949, 0.000701034887242213
WGE, WAK, 4, 0.000176439783712463, 0.0004837884799862
WGE, YAC, 16, 0.000158599726131509, 0.000694776097532106
WGE, ZAN, 30, 0.000147173296833793, 0.000730498974802784
WGE, KGS, 20, 4.66174643989729e-005, 8.26168791306086e-005
WGE, SIR, 44, 9.23995488491718e-005, 0.000114287982731782
```

Appendix E

The following changes must be applied to the gold data files under GoldData_v6.1 before running the accuracy assessment software:

File Name	Changes

map_proj/Sphere/LCC_60a.csv	Replace:
	
	`SCALE FACTOR: 0.70000`
	
	With:
	
	`PARALLEL ONE: 88.721725469719`
	`PARALLEL TWO: 6.400806738511`
	`#SCALE FACTOR: 0.70000`

map_proj/Sphere/LCC_61.csv	Replace:
	
	`SCALE FACTOR: 0.70000`
	
	With:
	
	`PARALLEL ONE: 41.171577695673`
	`PARALLEL TWO: -49.946673509297`
	`#SCALE FACTOR: 0.70000`

map_proj/Sphere/LCC_67.csv	Replace:
	
	`SCALE FACTOR: 1.00000`
	
	With:
	
	`PARALLEL ONE: 89.99970000`
	`PARALLEL TWO: 89.99970000`
	`#SCALE FACTOR: 1.00000`

map_proj/SRMmax/LCC_37a.csv	Replace:
	
	`SCALE FACTOR: 0.70000`
	
	With:
	
	`PARALLEL ONE: 6.11179388706249`
	`PARALLEL TWO: 88.7228746084839`
	`#SCALE FACTOR: 0.70000`

map_proj/SRMmax/LCC_38.csv	Replace: `SCALE FACTOR: 0.70000`

	With: PARALLEL ONE: 41.386639345913 PARALLEL TWO: -50.113947418586 #SCALE FACTOR: 0.70000
map_proj/SRMmax/LCC_44.csv	Replace: SCALE FACTOR: 1.00000 With: PARALLEL ONE: 89.99970000 PARALLEL TWO: 89.99970000 #SCALE FACTOR: 1.00000
map_proj/WGS84/LCC_14a.csv	Replace: SCALE FACTOR: 0.70000 With: PARALLEL ONE: 6.25610696306762 PARALLEL TWO: 88.7223009764950 #SCALE FACTOR: 0.70000
map_proj/WGS84/LCC_15.csv	Replace: SCALE FACTOR: 0.70000 With: PARALLEL ONE: -50.0306612963145 PARALLEL TWO: 41.279556918820 #SCALE FACTOR: 0.70000
map_proj/WGS84/LCC_21.csv	Replace: SCALE FACTOR: 1.00000 With: PARALLEL ONE: 89.99970000 PARALLEL TWO: 89.99970000 #SCALE FACTOR: 1.00000
NGA_3parDT/Set_A/Local_geodetic_201.csv	Replace: 3, DI-M, 25.000, -5.000, 0 2, DI-M, 20.000, -5.000, 0 With:

| | 2, DI-M, 20.000, -5.000, 0 |
| | 3, DI-M, 25.000, -5.000, 0 |

Appendix F

Section 1.2 states that, "The difference computation is the Euclidean distance between the computed position and the expected position via the gold data".

The following explains the meaning of the phrase, "the Euclidean distance between the computed position and the expected position". There are four cases:

For the forward map projection tests, whose outputs are rectangular coordinates in the projection plane and may be labeled (u,v), the difference is measured as:

$$E = \sqrt{(u_1 - u_2)^2 + (v_1 - v_2)^2}$$

For the inverse map projection tests, whose outputs are longitude (λ) and latitude (φ) in radians, the difference is measured as:

$$E = \sqrt{R_N{}^2 \cos^2(\varphi)(\lambda_1 - \lambda_2)^2 + R_M{}^2(\varphi_1 - \varphi_2)^2}$$

For any coordinate conversion tests whose outputs are Euclidean_3D coordinates (x,y,z), the difference is measured as:

$$E = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

For any coordinate conversion or datum transformation tests whose outputs are geodetic coordinates (λ, φ, h), the difference is measured as:

$$E = \sqrt{(R_N + h)^2 \cos^2(\varphi)(\lambda_1 - \lambda_2)^2 + (R_M + h)^2(\varphi_1 - \varphi_2)^2 + (h_1 - h_2)^2}$$

In the above formulas, the quantities $R_M, R_N, R_M + h, R_N + h$ are functions of φ and h, and may be evaluated at any of φ_1 or φ_2 or $(\varphi_1 + \varphi_2)/2$ for φ and any of h_1 or h_2 or $(h_1 + h_2)/2$ for h. The symbols R_M, R_N are defined in Table 5.6 of the SRM standard ISO/IEC 18026.