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Document No: 5033331
CAGE Code: 12436
Date: 22 September 2010

Mensuration Services Program (MSP)

Release Notes for

MSP Geographic Translator (GEOTRANS) Version 3.1

Program Title: Mensuration Services Program

Contract No: HM1572-06-C-0021
CDRL: A027
DID: Contractor Format

Prepared For: National Geospatial-Intelligence Agency
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Document No. 5033331
Date: 22 September 2010

Change Log

Version	Date	Description of Change
01	22 September 2010	Original issue.

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1. SCOPE

1.1 IDENTIFICATION

This document is the Release Notes for Version 3.1 of the MSP Geographic Translator (GEOTRANS).

1.2 SYSTEM OVERVIEW

GEOTRANS is an application that allows you to convert geographic coordinates among a wide variety of coordinate systems, map projections, grids, and datums. GEOTRANS runs in Microsoft Windows, LINUX and UNIX environments.

The user interface of GEOTRANS consists primarily of a single window. To convert coordinates, select the coordinate reference frame and datum in which your coordinates are defined, enter any associated parameters, and enter the coordinates in the upper half of the window. Then select the coordinate reference frame and datum to which you want the coordinates to be converted, and enter any associated parameters, in the lower half of the window. Click on the Convert Upper-to-Lower button, and the resulting coordinates will be displayed in the lower half of the window. You can convert additional coordinate sets from the same source by just entering the new coordinates and clicking on the Convert Upper-to-Lower button. You can change any of the coordinate reference frame, datum, or parameter selections at any time. Also, you can reverse the roles of input and output by using the Convert Lower-to-Upper button. Currently, thirty-five different types of coordinate systems, map projections, grids, and coding schemes are supported, as well as more than two hundred different horizontal datums.

GEOTRANS can also be used to efficiently convert large numbers of coordinates contained in text files. The file format is very simple. A multi-line file header defines the coordinate reference frame and datum of the coordinates contained in the file, including any associated parameter values. Following the header, each line contains a single set of coordinates, separated by commas followed by at least one space. Using the GEOTRANS file processing interface, you can select an existing file of coordinates to be converted. You can then define the coordinate reference frame and datum to which you want to convert the coordinates, along with any associated parameter values. Finally, you can specify the name and location of the output file that is to be created. GEOTRANS then converts all of the coordinates in the input file and creates the output file as a single operation.

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1.3 DOCUMENT OVERVIEW

The MSP GEOTRANS 3.1 Release Notes describes what has changed between the MSP GEOTRANS 3.0 release and the 3.1 release. It also describes the installation process.

GEOTRANS software is provided via the WWW, SIPRNet, and JWICS networks. It can also be requested via CD-ROM or DVD media. Users can download the executable software only or the executable software and the source code. Executable software is provided as built for three Operating Systems: Windows XP 32-bit, Sun Solaris 8 32-bit, and Red Hat Enterprise Linux (RHEL) v4 32-bit. It should also work on all later versions of these operating systems.

The GEOTRANS software consists of the Coordinate Conversion Service (CCS) libraries and the GEOTRANS application. The GEOTRANS CCS libraries are written in C++. The Windows version was built using MS Visual Studio 2008. The Solaris version was built using Sun Studio11 C++ v5.8. The Linux version was built using GCC v3.4.6. The GEOTRANS application GUI is written in Java and requires the Java Runtime Environment (JRE) version 1.5 or later to execute. We recommend using JRE version 1.6 update 19 or later that addresses all known vulnerability issues in the earlier versions of JRE.

Software Integrators should refer to the Programmer's Guide for information regarding the GEOTRANS software structure, the programming environment in which it was developed, the Application Programming Interface (API) and the process for building and modifying the GEOTRANS software.

Users should refer to the User's Guide for information regarding the capabilities and use of the GEOTRANS GUI for interactive coordinate conversion.

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2. REFERENCES

For the list of referenced documents, see the MSP GEOTRANS Programmer's Guide or the User's Guide.

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3. RELEASE NOTES DESCRIPTION

3.1 INVENTORY OF MATERIAL

The unclassified MSP GEOTRANS 3.1 release provides executables and libraries built for three of the ten MSP-supported operating systems and compiler combinations: Windows XP 32-bit, Sun Solaris 8 32-bit, and Red Hat Enterprise Linux (RHEL) v4 32-bit. MSP GEOTRANS 3.1 is also available for all ten MSP supported platforms in the classified MSP releases. Both dynamic link libraries (.so for Unix and .dll for Windows) and static link libraries (.a for Unix and .lib for Windows) are provided in this release.

The GEOTRANS software was designed to reduce as much as possible any operating system dependencies and therefore should work on all later versions of these operating systems (e.g., Windows 7, Solaris 10, RHEL v5). If not, the source code is provided for rebuilding on the user's platform or choice. For information regarding the GEOTRANS software structure and building the software from the source code, refer to the Programmer's Guide.

3.2 SYSTEM REQUIREMENTS

The hardware requirements of the GEOTRANS software are minimal. It is designed to run on any 32-bit or 64-bit processor with 256MB or more of memory and 128MB or more of available disk space.

3.3 ADDITIONAL SOFTWARE REQUIRED

3.3.1 JAVA RUNTIME ENVIRONMENT

The GEOTRANS application GUI is written in Java and requires the JRE to execute. JRE version 1.6.0.19 resolves all known vulnerabilities and was used for testing MSP GEOTRANS 3.1. It is recommended that the GEOTRANS users also use 1.6.0.19 or later. JRE 1.6.0.19 or the latest JRE can be downloaded from the Oracle website:

http://www.oracle.com/technetwork/indexes/downloads/index.html.

3.4 SUMMARY OF SOFTWARE CHANGES

MSP GEOTRANS 3.1 is the second release of the re-architected GEOTRANS application under the MSP program. This release satisfies one new requirement and repairs several issues discovered in operations. There is no change to the look and feel of the GUI, therefore user

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transition from GEOTRANS 3.0 to 3.1 should be seamless. There is no change to the API, therefore integrators should easily upgrade from GEOTRANS 3.0 to 3.1 libraries.

The one new requirement is "MSP shall allow the capability for EGM84 with 30 minute by 30 minute grid spacing with bilinear interpolation." The earth gravity model (EGM) is used to convert heights between Mean Sea Level (MSL) and the Ellipsoid. Published in 1984, EGM84 is a grid at 30 minute longitude and latitude spacing that describes the height difference between MSL and the Ellipsoid. GEOTRANS 3.0 and predecessor versions provided this conversion by interpolating the EGM84 table at 10 degree intervals. This new requirement, implemented in GEOTRANS 3.1, provides the conversion by interpolating the EGM84 table at the native 30 minute intervals, providing the most accurate conversion between EGM84 MSL and the Ellipsoid. The 10 degree interval conversion remains in the software and either can be selected through the CCS API or the GEOTRANS GUI (see User's Guide 3.2.2.1 for more details).

The following tables describe the resolved Discrepancy Reports (DRs) and Enhancement Requests (ERs) included in the MSP GEOTRANS 3.1 release (Table 1), the Open Discrepancy Reports remaining in the MSP GEOTRANS 3.1 release (Table 2) for implementation in a future release and the Open Enhancement Requests (Table 3) for consideration in a future release.

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Table 1. MSP GEOTRANS 3.1 Resolved DRs and ERs

ID	Title	Pri	Impact	Resolution/Workaround
25444	Not able to launch GEOTRANS as a background process on UNIX platforms	4	Minor. Users can't launch GEOTRANS as a background process using the runGeotrans.csh&	The workaround was to launch as a foreground process, and then cntl-Z, bg. The resolution added the –f option to the runGeotrans.csh startup script.
25791	GEOTRANS 3.0 on IRIX host getting Java errors on some conversions	4	Some coordinate conversions fail for GEOTRANS GUI users running on IRIX platforms.	The resolution modified the code and build scripts to use java 1.4.1 library calls for IRIX.
26542	SRD 3.2.1.7.10.5: Add height conversion using EGM84 with 30 minute grid spacing with bilinear interpolation	5	Users and Integrators requiring EGM84 conversion of height between MSL and Ellipsoid can choose to use the more accurate conversion.	The resolution added the 30 minute bilinear interpolation to CCS and to add a new HeightType enumeration, making the HeightType enumeration available from the GEOTRANS GUI.
26659	MSP GEOTRANS document update	5	Information provided in Programmers Guide is lacking for some integrators.	The resolution augmented Programmer's Guide with the information requested in the DR.
26674	Missing ValidateDatum in GEOTRANS 3.0 API	4	Users cannot validate that a coordinate is within the validity rectangle for the specified datum. This was available in GEOTRANS 2.4.2.	The resolution added the validDatum method to the DatumLibrary.
26676	Error is always returned when calling GetDatumParameters in GEOTRANS API	4	Users cannot use the GetDatumParameters method to get the datum parameters for a 3 or 7 parameter datum.	The resolution corrected the error handling in method GetDatumParameters.
26723	Distribute import libraries on Unclassified GEOTRANS website	4	Integrators who need the Windows import (static) libraries need to build them from the source.	The resolution provides the static libraries in the Windows download available from the website.
26724	Misleading error when MSPCCS_DATA is not set	4	User confusion; a memory error is returned when MSPCCS_DATA is not set, instead of a file not found error.	The resolution corrected the error handling and throw the proper exception.
27181	GEOTRANS 3.0 UTM reporting in high latitude special zones is incorrect	3	Converting to UTM does not apply the special zone logic in the higher latitude regions over Southern Norway and Svalgard.	The resolution for conversions to UTM added logic to check for a UTM zone override and use it, else check for the higher latitude regions and apply the special zone rules.

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ID	Title	Pri	Impact	Resolution/Workaround
27211	UPS Coordinates files are missing from MGRS package	4	Users downloading the MGRS only package from the GEOTRANS website cannot build the software.	The workaround was to download the Master package and copy the files missing from the MGRS only package. The resolution added the missing files (UPSCoordinates.h and UPSCoordinates.cpp) to the MGRS only package.
27271	Coordinate Conversion returns an error incorrectly for high latitude TM conversion	3	Users are unnecessarily warned of distortion when converting Transverse Mercator to Geodetic at some higher latitudes.	The resolution corrected a test for distortion that causes the warning message to be generated.

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Table 2. MSP GEOTRANS 3.1 Open DRs

ID	Title	Pri	Impact	Resolution/Workaround
25204	GEOTRANS vs MSP – Quit vs Exit on closing windows	4	None. A different convention is used on the GEOTRANS GUI and MSP GUI to close the application ("Quit" vs "Exit"). Consistency would be nice.	The resolution is to change GEOTRANS to use "Quit" on the File dropdown menu.
27155	GEOTRANS coordinate file header does not reflect Longitude/Latitude order	4	Users are mislead into entering coordinates in the incorrect order for batch mode conversion when longitude/latitude order is selected.	The resolution is to change the example coordinate written to the header .dat file to reflect the order selected, instead of always being latitude/longitude.
27157	GEOTRANS Format window does not reflect all format choices	4	Minor. Users do not see all the format options selected in the "New Format" displayed to them when "Apply" is selected.	The resolution is to change the "Current Format" and "New Format" widgets to reflect all the format options available (Geodetic Separator, Longitude Range, Leading Zeroes).
27158	GEOTRANS in the Java, Look and Feel mode, Enter does not remove the "Help, About" GUI	4	Minor. User cannot close the "Help About" GUI using the Enter key from the keyboard when Java Look and Feel mode selected.	The workaround is to select the OK button to remove the window. The resolution is to allow Enter to close the window when in the Java Look and Feel mode, as is the case for the Solaris and Windows Look and Feel modes.
27338	GEOTRANS 3.0 is too lax with latitude bands in MGRS	4	Users can enter invalid MGRS coordinates and perform conversions that produce misleading results.	The resolution is to display: 1) An Error message for invalid MGRS coordinates. 2) A warning message when the MGRS coordinate falls within the grid squares along the boundary of the MGRS zone/band.

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Table 3. MSP GEOTRANS 3.1 Open ERs

ID	Title	Pri	Impact	Resolution/Workaround
25411	GEOTRANS GUI File -> Load Setting returns an error	5	Users of GEOTRANS installed as a shared application on a network cannot Save and Load personal settings.	The resolution is to provide the capability to save and restore settings to/from a User's Home directory, instead of to/from the installed directory.
26200	MSP should allow for third party coordinate conversions	5	Users are limited to the coordinate conversions provided by GEOTRANS.	The resolution is to design the capability for a "plug-in" coordinate conversion.
26267	MSP enhancement to add EGM 2008 to GEOTRANS	5	Users cannot take advantage of the latest, most accurate EGM 2008.	The resolution is to add EGM 2008 and the preferred interpolation method to the possible choices for performing MSL to/from Ellipsoid height conversions. The EGM 2008 model is much denser than the most current EGM 96 model currently supported (2.5 minute vs 15 minute grid spacing).
26551	Add UTM units option of US Survey Feet	5	Surveyors in the US who use units of US Survey Feet with UTM coordinates cannot use GEOTRANS to/from UTM coordinates.	The resolution is to add the US Survey Feet as a selectable unit for UTM Easting and Northing values.
26987	MSP GEOTRANS should add new transformation model	5	GEOTRANS users cannot use the seven parameter model described in NATO STANAG 2211.	The resolution is to add the transformation to the CCS and to the GEOTRANS GUI as described in NATO STANAG 2211.
27339	Add an "administrative rules" button to the UTM coordinate option	5	Related to DR 27181: Users cannot convert to True UTM coordinates in the special regions over Southern Norway and Svalgard, without specifying a zone override.	The resolution is to add an "Administrative Rules" button to the GEOTRANS GUI to control whether True UTM coordinates are returned or the special rules for UTM zones are returned.

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3.5. INSTALLATION INSTRUCTIONS

The unclassified MSP GEOTRANS 3.1 release can be downloaded from the WWW, SIPRNet or JWICS networks—or can be delivered via CD-ROM or DVD media by request. The unclassified MSP GEOTRANS 3.1 release is provided in zip format for Windows platforms and tgz format for Unix platforms and does not require a registration key or a license key to install and run. The MSP GEOTRANS web page addresses are as follows:

WWW – http://earth-info.nga.mil/GandG/geotrans/

SIPRNet – http://www.geoint.nga.smil.mil/products/gandg/geotrans

JWICS – http://www.geoint.nga.ic.gov/products/gandg/geotrans/

The GEOTRANS 3.1 application requires the 32-bit JRE to operate. JRE version 1.6.0 update19 or later is recommended. The startup script may need to be modified to set the correct version of the JRE.

The startup script for Solaris systems is found in:

      <install dir>/geotrans3.1/GEOTRANS3/solaris/runGeotrans.csh,

For Linux systems, it is found in:

      <install dir>/geotrans3.1/GEOTRANS3/linux/runGeotrans.csh

For Windows systems, it is found in:

      <install dir>\geotrans3.1\GEOTRANS3\win\runGeotrans.bat.

For Unix systems, using an editor of your choice, open the runGeotrans.csh start up script and modify the following line so that the parameter JAVA_HOME is set to Java's home directory. For example :

      setenv JAVA_HOME /usr/jdk1.6.0_19

For Windows systems, using an editor of your choice, open the runGeotrans.bat startup script and modify the following line so that the path to the JRE is set correctly. For example change:

      @java –Xss1024k –jar MSPCCS.jar

         to

      @"C:\Program Files\java\jre1.6.0_19\bin\java.exe" –Xss1024k –jar MSPCCS.jar

For 64-bit Windows platforms, the 32-bit JRE is loaded in "Program Files (x86)". For example:

      @"C:\Program Files (x86)\java\jre1.6.0_19\bin\java.exe" –Xss1024k –jar MSPCCS.jar

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3.6 MSP HELP DESK SUPPORT

For help with the installation, to request a delivery on CD-ROM or DVD media, to report an issue, or for general help of any kind, contact the MSP Help Line at 858-592-5677 (5MSP) or msphelp@baesystems.com.

GEOTRANS Enhancement Requests can also be reported to the MSP Help Line or to the NGA Coordinate Systems Analysis Team (CSAT) at (314) 676-9124, DSN 846-9124 or coordsys@nga.mil.

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APPENDIX A – ACRONYMS

API	Application Programming Interface
CCS	Coordinate Conversion Service
CD-ROM	Compact Disk – Read Only Memory
CSAT	Coordinate Systems Analysis Team
DR	Discrepancy Report
DVD	Digital Versatile/Video Disk
EGM	Earth Gravity Model
ER	Enhancement Request
GCC	Gnu Compiler Collection
GEOTRANS	Geographic Translator
GUI	Graphical User Interface
JRE	Java Runtime Environment
MB	MegaByte
MS	Microsoft
MSL	Mean Sea Level
MSP	Mensuration Services Program
NGA	National Geospatial-Intelligence Agency
RHEL	Red Hat Enterprise Linux
WWW	World Wide Web