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Mensuration Services Program (MSP)

Release Notes for

MSP Geographic Translator (GEOTRANS) Version 3.2

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Change Log

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01	6 October 2011	Original issue.
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1. SCOPE

1.1 IDENTIFICATION

This document is the Release Notes for Version 3.2 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.

1.3 DOCUMENT OVERVIEW

The MSP GEOTRANS 3.2 Release Notes describes what has changed between the MSP GEOTRANS 3.1 release and the 3.2 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 24 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.

3. RELEASE NOTES DESCRIPTION

3.1 INVENTORY OF MATERIAL

The unclassified MSP GEOTRANS 3.2 release provides executables and libraries built for three 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 3.2 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 1.6.0.24 resolves all known vulnerabilities and was used for testing MSP GEOTRANS 3.2. It is recommended that the GEOTRANS users also use 1.6.0.24 or later. JRE 1.6.0.24 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 3.2 is the third release of the re-architected GEOTRANS application under the MSP program. This release satisfies one new requirement and repairs several issues discovered in operations. The one new requirement is "MSP shall allow EGM08 with 2.5 minute by 2.5 minute grid spacing and natural spline interpolator." There is no change to the look and

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feel of the GUI, therefore user transition from GEOTRANS 3.1 to 3.2 should be seamless. There is no change to the API, therefore integrators should easily upgrade from GEOTRANS 3.1 to 3.2 libraries.

NOTE: In GEOTRANS 3.2 an iterative algorithm is used in the Geocentric to Geodetic conversion to achieve better accuracy. If a user needs to revert back to the legacy non-iterative GEOTRANS algorithm, then an environment variable MSPCCS_USE_LEGACY_GEOTRANS needs to be defined before starting GEOTRANS.

The following tables describe the resolved Discrepancy Reports (DRs) and Enhancement Requests (ERs) included in the MSP GEOTRANS 3.2 release (Table 1), the Open Discrepancy Reports remaining in the MSP GEOTRANS 3.2 release (Table 2) for implementation in a future release and the Open Enhancement Requests (Table 3) for consideration in a future release.

Table 1. MSP GEOTRANS 3.2 Resolved DRs and ERs

ID	Title	Pri	Impact	Resolution/Workaround
26267	MSP enhancement to add EGM 2008 to GEOTRANS	9	Users cannot take advantage of the latest, most accurate EGM 2008.	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).
27155	GEOTRANS coordinate file header does not reflect Longitude/Latitude order	4	Users are misled into entering coordinates in the incorrect order for batch mode conversion when longitude/latitude order is selected.	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.	Change the “Current Format” and “New Format” widgets to reflect all the format options available (Geodetic Separator, Longitude Range, Leading Zeroes).
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.
27499	Enhance GEOTRANS ECF-GEO transformation	9	The GEOTRANS geocentric-geodetic transformation is accurate to approximately 3mm.	Replaced the old transformation with a new iterative transformation.
27554	Memory Leaks in CCS	4	Memory leak could potentially grow to the point of being a problem	The leak was in the geodetic/MGRS/UTM conversion and was removed.
27562	UTM to MGRS conversion off by 0.5 meters	4	Rounding can make a MGRS conversion off by up to 0.5 meters. This can move the result to the wrong zone.	Rounding is no longer done before converting coordinates. This was done for MGRS and USNG coordinates.
27713	Azimuthal Equidistant coordinates with central meridian < 1 degree with non-zero origin latitude results in an error	3	Coordinates in the range described by the title cannot be used.	The latitude check had a wrong sign on a one degree boundary check.

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ID	Title	Pri	Impact	Resolution/Workaround
27716	Improve CCS sample code	5	Change the CCS sample code to instantiate a pointer to CoordinateConversionService and re-use the pointer to improve the performance.	Updated code and also cleaned up code, comments, and input coordinates to make it easier to read and to use as sample code.
27737	Batch Coordinate Conversion limit of 650,00 points	3	A batch coordinate conversion in GeoTrans 3.0 crashed with a file containing greater than 650,000 points	Changed code such that when buffer hit 100,000 conversions, the conversions are processed before reading in more.
27847	Typo in GeoTrans Users Guide	5	None.	Typo was fixed.
27868	Provide GeoTrans .bat file for 64 bit Windows	5	Makes it easier for people using 64 bit windows to use GeoTrans.	Distribute an InstallAnywhere package for Windows that install Geotrans and the 32-bit JRE automatically.
27958	GeoTrans Geodetic to Gnomonic conversion has a discontinuity at the South Pole.	4	Very close to the South Pole, the Geodetic to Gnomonic conversion is not accurate.	A sign error was found in the equation governing this transformation.
28017	Oblique Mercator projection gives unexpected results near the poles.	4	The Oblique Mercator projection gives wrong results near the poles.	If longitude spans greater than 90 degrees, the Northing results are computed from a rotated (90 deg) value.
28127	Correct dtcc solution file to specify the correct Muti-threaded dll library	4	An MSP Geotrans integrator had a problem linking and running the Geotrans software in debug mode using the spreadsheet tester.	Specify the correct multi-threaded library in the solution file.
28408	Zone Override does not work when converting UTM to UTM	4	The Zone Override button does not work when converting UTM to UTM. It always returns the 'natural' zone.	Modified checkParametersChanged in MSP_GEOTRANS.java to pick up the correct source and target from the upper and lower panel settings.
29500	GeoTrans: EGM 2008 GUI changes	4	Customer requested EGM 2008 height appeared at the top of the height model list in the GUI. Customer also requested "recommended" to be removed from the GUI.	Removed "recommended" text from all EGM and documentation. Moved the EGM 2008 to top of height model list on GUI.

Table 2. MSP GEOTRANS 3.2 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.
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.
28146	Geotrans conversion from Geocentric to Geodetic with precision set to .001m displays some results in Scientific Notation	4	Inconsistent display of results and cannot do round-trip conversions between Geodetic and Geocentric with Precision set to .001m and format set to dms.s or dm.m.	None.
29174	MSP GeoTrans does not output batch coordinates in range 0-360	4	One format option is to report lat/lon results in the range of 0 to 360 degrees. This works on the GUI display, but is ignored when doing file processing. Coordinates are valid, but may not be displayed as desired.	None

Table 3. MSP GEOTRANS 3.2 Open ERs

ID	Title	Pri	Impact	Resolution/Workaround
25411	GEOTRANS GUI File -> Load Setting returns an error	9	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	9	Users are limited to the coordinate conversions provided by GEOTRANS.	The resolution is to design the capability for a "plug-in" coordinate conversion.
26551	Add UTM units option of US Survey Feet	9	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	9	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	9	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.

3.5. INSTALLATION INSTRUCTIONS

The unclassified MSP GEOTRANS 3.2 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 3.2 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 3.2 application requires the 32-bit JRE to operate. JRE version 1.6.0 update 24 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>/geotrans3.2/GEOTRANS3/solaris/runGeotrans.csh,

For Linux systems, it is found in:

<install dir>/geotrans3.2/GEOTRANS3/linux/runGeotrans.csh

For Windows systems, it is found in:

<install dir>\geotrans3.2\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_24

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_24\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_24\bin\java.exe" -Xss1024k -jar MSPCCS.jar

NOTE: GEOTRANS 3.2 Windows users are recommended to download the self installation InstallAnywhere package. After downloading the installation file from the web-site, double click on install.exe and follow on screen instructions to complete the installation. The 32-bit JRE is installed automatically and users can double click on the shortcut icon to start GEOTRANS. In case users choose not to create shortcut icon, navigate to <installation_dir>/GEOTRANS3 and double click on MSP_GEOTRANS3.exe to start GEOTRANS.

Figure 1 – InstallAnywhere Introduction Screen

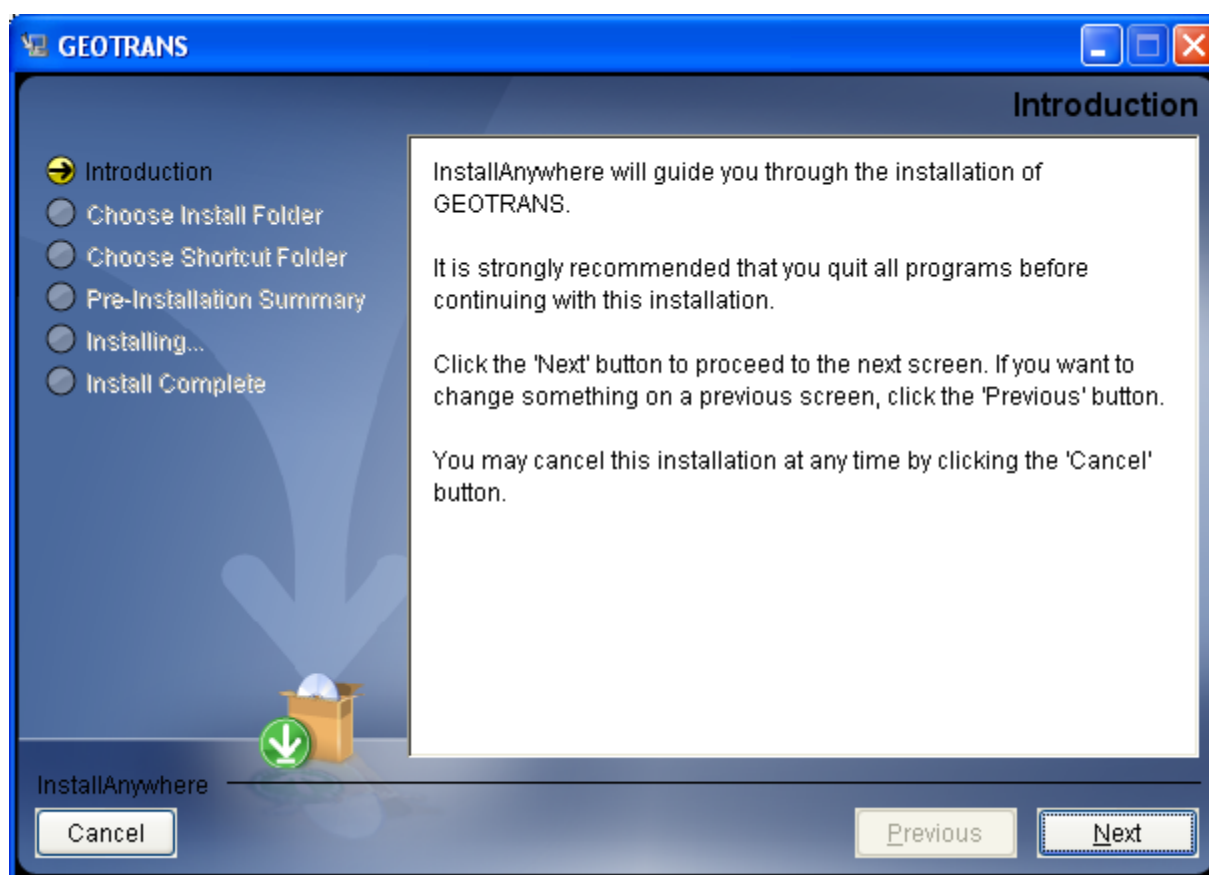
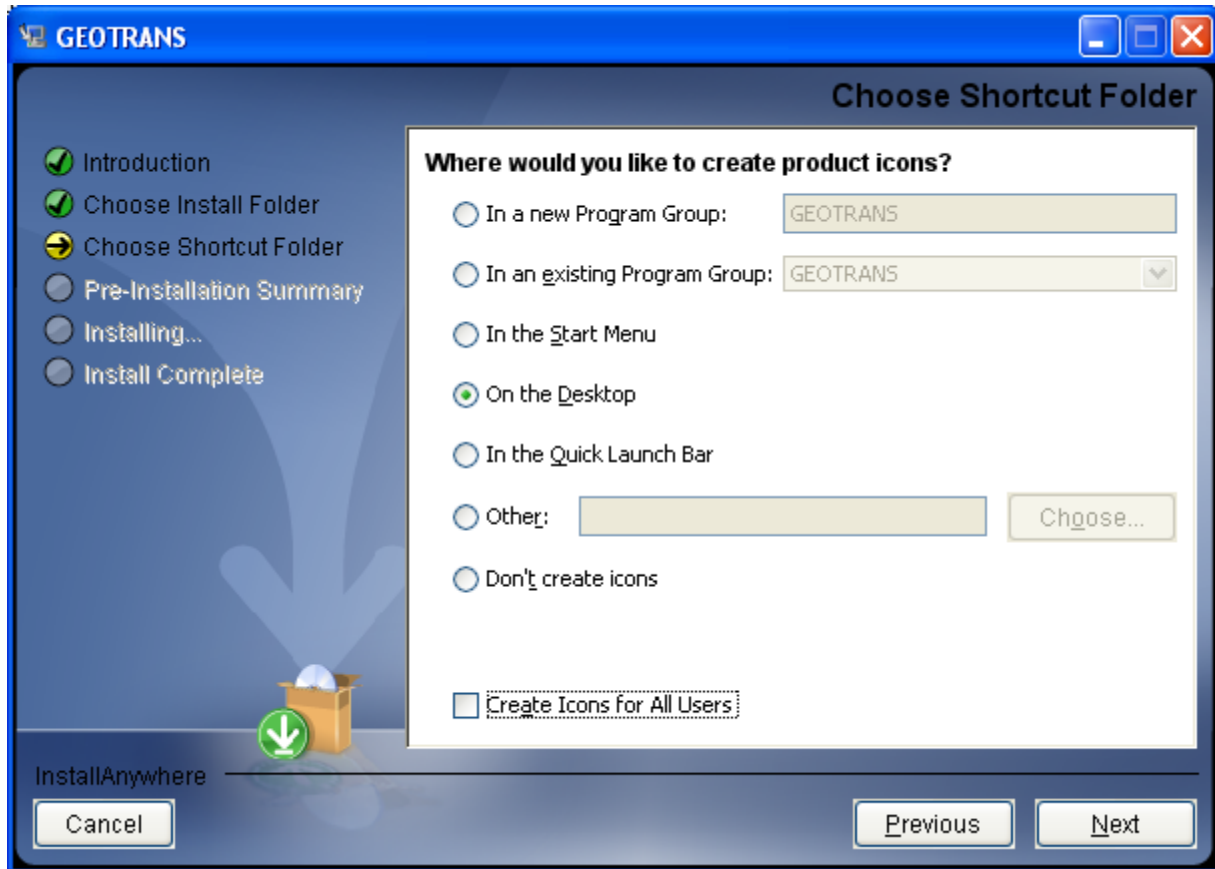


Figure 2 – InstallAnywhere Create Shortcut Option

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.

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