

U. S. DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GSMDATUM and GSPDATUM, programs for DOS microcomputers to convert data in GSMAP or GSPOST format between the NAD27 and NAD 83 coordinate systems.

by

Gary I. Selner and Richard B. Taylor

Open-File Report 93-536

Three 3 1/2" disks, documentation on disk

DISCLAIMER

Although program tests have been made, no guarantee (expressed or implied) is made by the authors U.S. Geological Survey regarding program correctness, accuracy, or proper execution on all computer systems. Any use of trade names is for descriptive purposes only and does not imply endorsement by the U.S. Geological Survey. This report and has not been reviewed for conformity with the U.S. Geological Survey editorial standards.

Denver, Colorado

July, 1993

GSMDATUM is a program that converts coordinates of GSMAP data in GSMAP Version 9 data bases from the 1927 North American datum (NAD 27) to the 1983 datum (NAD 83) coordinate system, or NAD 83 data to NAD 27.

GSPDATUM is a counterpart conversion program for GSPOST format files that use geodetic coordinates to specify locations.

These two coordinate systems are discussed by Snyder, 1987, p. 11-13, 56, 373-376. The geodetic coordinates for almost all points in North America change slightly. NAD 83 is Earth centered and based on satellite and terrestrial data. Although most published maps use NAD 27 coordinates, maps are now being prepared based on the NAD 83 system. Digitizing from these maps generates NAD 83 coordinates, and plots made to match such maps must use NAD 83 coordinates. Projection parameter files for GSMAP and GSPOST plots must use the proper values for the equatorial and polar radii of the Earth, Selner and Taylor, 1993 p.312.

The GSMDATUM Menu screen offers the choices below:

- 1 - CONVERT INPUT DATA SET FROM 1927 DATUM TO 1983 DATUM
- 2 - CONVERT INPUT DATA SET FROM 1983 DATUM TO 1927 DATUM

Prompts will request entry of the name of the input data base or data file, and the name of the output data base and title for the GSMAP output data base. We suggest that you put the DATUM of the output data base into the title of the output GSMAP data base to remind users of the datum used. Similarly, add a note to the GSPOST file using a line between line 1 of the file and the first data row.

Before using the GSMDATUM program be sure that you understand the purpose of the contemplated conversion. Do not mix NAD 27 and NAD 83 data in a single GSMAP data base, don't merge a NAD 27 data base with a NAD 83 data base.

The GSMDATUM and the GSPDATUM programs require supporting data files for operation. These files have matching names with extensions DAO and DAA.

Files named CONUS apply to the conterminous US, those with the name ALASKA to Alaska and surrounding areas. These files should be in the active area or in the area specified by the SET GSFILES=

environmental variable, see Selner and Taylor, 1993, p. 356-357. Some of these data files are very large; only the files that apply to the data being processed need be present. The data set for Alaska requires more than 2 Mbytes of disk storage. There is little logic in wasting disk space if some of these data files will not be needed.

14 datum files covering seven areas are included in this release: both the files with extensions DAO and DAA must be present for the area being processed. The program automatically selects the proper datum file(s) for the data being processed.

Areas covered by datum files are listed below: conversions for areas not listed can not be made from these files. The areas covered include the U.S. EEZ as well as land areas.

ALASKA State of Alaska and nearby areas
CONUS Conterminous United States
HAWAII Hawaii
PRVI Puerto Rico and Virgin Islands
STGEORGE St George Island
STLRNC St Lawrence Island
STPAUL St Paul Island

The 14 files listed below are contained on the release disks
in two self-extracting archives prepared using LHARC (ALASKA.EXE
and OTHER.EXE)

ALASKA DAA 779720 12-01-92 8:40a
ALASKA DAO 779720 12-01-92 8:42a

CONUS DAA 264264 11-20-92 11:55a
CONUS DAO 264264 11-20-92 11:56a

HAWAII DAA 451848 12-08-92 7:26a
HAWAII DAO 451848 12-08-92 7:28a

PRVI DAA 26568 12-01-92 8:44a
PRVI DAO 26568 12-01-92 8:44a

STGEORGE DAA 59048 12-08-92 7:50a
STGEORGE DAO 59048 12-08-92 7:50a

STLRNC DAA 26568 12-08-92 7:40a
STLRNC DAO 26568 12-08-92 7:40a

STPAUL DAA 6888 12-08-92 7:38a
STPAUL DAO 6888 12-08-92 7:38a

14 file(s) 3229808 bytes

To extract these datum files, move to the appropriate directory on your hard disk, insert disk #3 into drive B.: type B:OTHER to obtain the datum files exclusive of the Alaska files, or with Disk #2 in the drive type B:alaska to obtain the Alaska datum files. The datum files are binary files, so don't try to print them. These datum files contain data needed by the GSMDATUM and GSPDATUM programs to convert between the NAD27 and NAD 83 coordinate systems.

The GSMDATUM and GSPDATUM programs are present on disk #1 (GSMDATUM.EXE and GSPDATUM.EXE). Copy these programs into an appropriate directory.

REFERENCES

Boyle, D., 1992, NADCON Version 2.0, a program (Fortran) to transform latitude and longitude coordinate values between NAD 27 and NAD 83, National Geodetic Survey. All data files furnished by the National Geodetic Survey.

Selner, G.I. and Taylor, R.B. 1993, System 9, GSMAP and other programs for the IBM PC and compatible microcomputers to assist workers in the Earth sciences, U.S. Geological Survey Open File Report 93-511, 371 p., two 3 1/2 " disks.

Snyder, J. P., 1987, Map projections, a working manual: U.S. Geological Survey Professional Paper 1395, 393 p.

GSMDATUM and GSPDATUM were written and tested using the Microsoft QuickBasic Compiler Version 4.0b.