

# 1980 Census of Population and Housing Congressional District Boundary File (98<sup>th</sup> Congress). Technical Documentation

D1-D80-98CD-14-TECH

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Census of Population and Housing, 1980:  
Congressional District Boundary File (98th Congress)

Technical Documentation

The documentation consists of the following materials:

Attachment 1	Abstract
Attachment 2	Record Description
Attachment 3	Coordinate Conversion Subroutines

NOTE

Questions about the accompanying documentation should be directed to Data User Services Division, Data Access and Use Staff, Bureau of the Census, Washington, D.C. 20233. Phone: (301) 763-2074.

Questions about the tape should be directed to Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233. Phone: (301) 763-4100.

Questions about the subject matter should be directed to Geography Division, Bureau of the Census, Washington, D.C. 20233. Phone: (301) 763-7856.

ATTACHMENT 1

Abstract

Census of Population and Housing, 1980:  
Congressional District Boundary File (98th  
Congress) [machine-readable data file] /  
prepared by the Bureau of the Census.  
—Washington: The Bureau, [producer and  
distributor], 1983.

TYPE OF FILE:

Geographic reference file (polygon boundary).

SUBJECT-MATTER DESCRIPTION:

This file is a digitized representation of the boundaries of the 435 Congressional Districts of the 98th U.S. Congress. It is designed as a polygon file suitable for the computer mapping of statistical data.

GEOGRAPHIC COVERAGE:

U.S. Congressional Districts.

FILE STRUCTURE: Rectangular (51 files; one for each state and the District of Columbia).

FILE SIZE:

11,980 logical records; 20 character logical record length.

REFERENCE MATERIALS:

"Census of Population and Housing, 1980: Congressional District Boundary File (98th Congress) Technical Documentation". The documentation includes this abstract, record description, and coordinate conversion subroutines.

RELATED PRINTED REPORTS AND DATA FILES:

"Congressional District Boundary Files (for the 94th and 96th Congresses)". These computer files provide polygon structures for congressional districts similar to the boundary file for the 98th Congress. Each file is available on one reel of tape (at 1600 or 6250 bpi) from Customer Services.

"Summary Tape Files 1D and 3D". These computer files contain the full range of 100% (STF 1D) and sample (STF 3D) data from the 1980 census for congressional districts of the 98th Congress. STF 1D files are currently available on a State-by-State basis or for the entire U.S. from Customer Services. STF 3D files will be available later this year (1983).

PHC80-4 Congressional Districts of the 98th Congress. These reports (1 for each state and the District of Columbia) will present selected 100% and sample data for congressional districts of the 98th Congress. Each report will include maps identifying the boundaries of each congressional district. These reports will be available later this year (1983) from the U.S. Government Printing Office.

GE-50, No.77 Congressional Districts of the 98th Congress. This printed map (30x42 inches) shows boundaries for all congressional districts of the 98th Congress. This map is available from the U.S. Government Printing Office for \$4.00 (S/N 003-024-05006-4).

Congressional District Atlas: Districts of the 98th Congress. This atlas presents maps showing boundaries for all congressional districts of the 98th Congress of the United States. Maps are also included for the District of Columbia, Puerto Rico, and the outlying areas. The atlas contains listings identifying the congressional districts in which counties and incorporated places within each multi-congressional district state are located. It is available from the U.S. Government Printing Office for \$12.00 (S/N 003-024-05005-6).

**FILE AVAILABILITY:**

The file is available from Data User Services Division, Customer Services (Tapes), Bureau of the Census, Washington, D.C. 20233. It is available on one reel at 1600 bpi or 6250 bpi for \$140. When ordering, please refer to file number Cu GEO 80-004.

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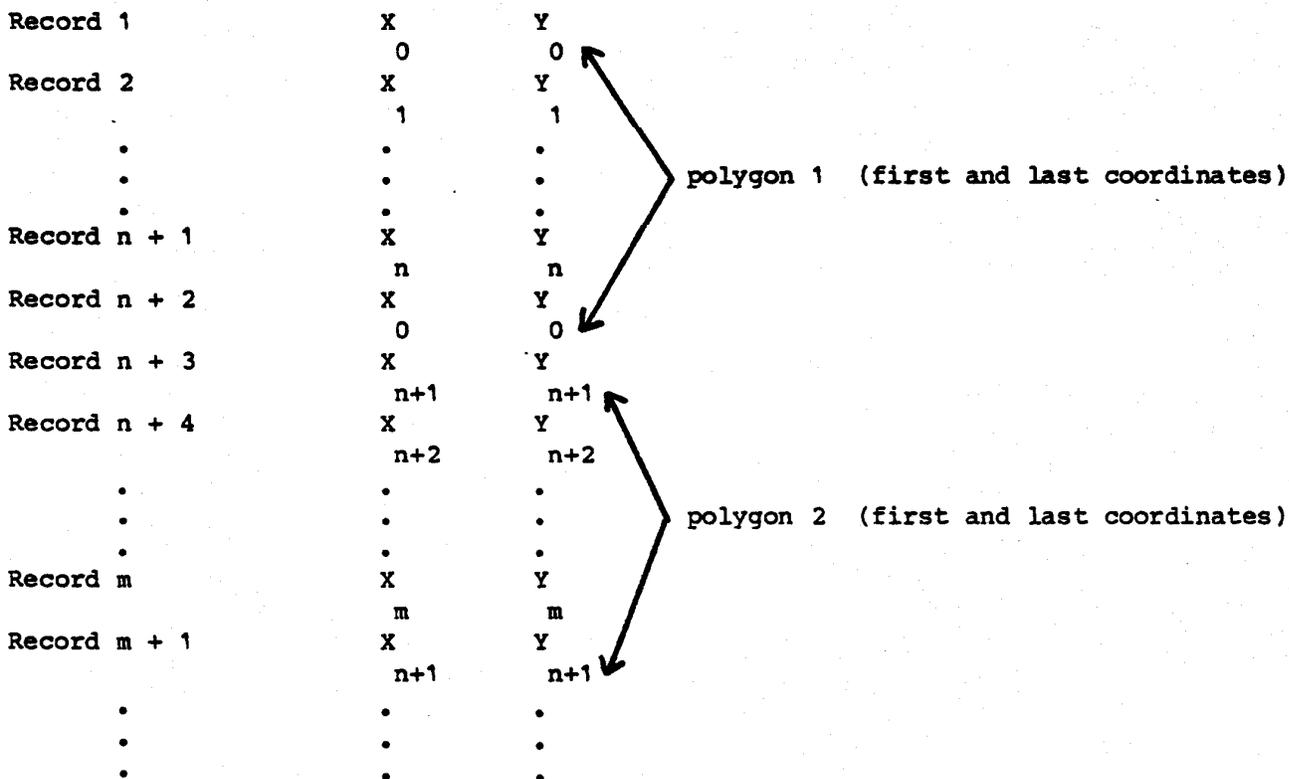
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ATTACHMENT 2

Record Description

<u>Characters</u>	<u>Description</u>
1-2	Filler
3-4	FIPS State code
5-8	U.S. Congressional District code
9-14	X coordinate
15-20	y coordinate

The Congressional District Boundary File is in a polygonal form where each congressional district consists of a series of X,Y coordinate records representing points bounding the congressional district. The first coordinate record in a polygon is repeated as the last coordinates in the polygon to indicate closure (see figure below). Some congressional districts may be made up of more than one polygon. Coordinates are given in terms of Alber's Equal Area map projection at the scale of 1:5 million and are measured in thousandths of an inch (0.001).



ATTACHMENT 3

Coordinate Conversion Subroutines

The attached FORTRAN subroutines can be used to convert Alber's Equal Area map projection coordinates to latitude/longitude coordinates and the converse (except for Alaska and Hawaii). Subroutine ALBER 1 converts Alber's Equal Area map projection in inches to latitude/longitude degrees. Subroutine ALBER 2 converts latitude/longitude degrees to Alber's Equal Area map projection in inches.

Subroutine ALBER 1: Converts an Alber's Equal Area map projection in inches to latitude/longitude degrees.

GGCRB\*ROY(1).ALBER1(0)

```

1      SUBROUTINE ALBER(X,Y)
2      DATA IFIRST/0/
3      IFC(IFIRST.NE.0)GO TO 30
4      IFIRST=1
5      RAD=50.60
6      DEGREE=3.14159/180.
7      YMAX=79.7
8      PHI1=29.5*DEGREE
9      PHI2=45.5*DEGREE
10     CP1=COS(PHI1)
11     CP2=COS(PHI2)
12     SP1=SIN(PHI1)
13     SP2=SIN(PHI2)
14     AN=(CP1*CP1-CP2*CP2)/(2.*(SP2-SP1))
15     C2=RAD*RAD/AN
16     C1=C2*(CP1*CP1/AN+2.*SP1)
17     C2=2.*C2
18     CMERID=95.5*DEGREE
19     30   DEGX=CMERID-ATAN2((X-20.8),YMAX-Y)/AN
20     Y=ASIN((((X-20.8)/SIN(AN*(CMERID-DEGX))))**2-C1)/-C2
21     X=DEGX
22     RETURN
23     END

```

Subroutine ALBER 2: Converts latitude/longitude degrees to an  
Alber's Equal Area map projection in inches.

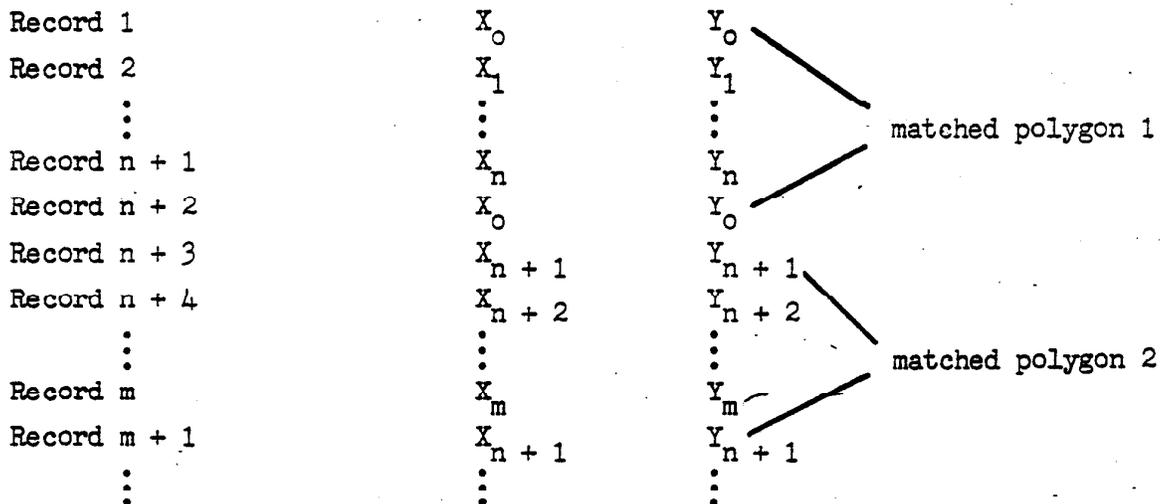
GGCRB\*ROY(1).ALBER(2)

```
1 SUBROUTINE ALBER(X,Y)
2 DATA IFIRST/0/
3 IFC(IFIRST.NE.0)GO TO 30
4 IFIRST=1
5 RAD=50.60
6 DEGREE=3.14159/180.
7 YMAX=79.7
8 PHI1=29.5*DEGREE
9 PHI2=45.5*DEGREE
10 CP1=COS(PHI1)
11 CP2=COS(PHI2)
12 SP1=SIN(PHI1)
13 SP2=SIN(PHI2)
14 AN=(CP1*CP1-CP2*CP2)/(2.*(SP2-SP1))
15 C2=RAD*RAD/AN
16 C1=C2*(CP1*CP1/AN+2.*SP1)
17 C2=2.*C2
18 CMERID=95.5*DEGREE
19 30 RHO=SQRT(C1-C2*SIN(Y))
20 THETA=AN*(CMERID-X)
21 X=RHO*SIN(THETA)+20.8
22 Y=YMAX-RHO*COS(THETA)
23 RETURN
24 END
```

U.S. Department of Commerce  
 U.S. Bureau of the Census  
 Washington, D.C. 20233

Congressional District Geographic Boundary File 96th Congress  
 Technical Documentation

CDBF is a congressional district boundary file in a polygonal form. Each record represents a point on a polygon. When the coordinate in the first record is matched with a coordinate in a later record then that series of points defines a completed polygon.



This file matches the DIMECO file in size and projection. The projection is ALBERS' equal area projection at a scale of 1:5 million, with the central meridian of  $95.5^\circ$  and the principal parallels of  $29.5^\circ$  and  $45.5^\circ$ . Plotting the U.S. with these coordinate at a 1:1 scale yields a 40" x 30" map with a 1" margin. The origin (0.0,0.0) is at the lower left hand corner.

Record layout

Characters

1-7	State FIPS code
8-13	Congressional District number
14-20	Record number
21-28	X coordinate in inches
29-36	Y coordinate in inches

The attached subroutines ALBER converts degrees to inches and subroutines ALBER 1 converts inches to degrees for the congressional or DIMECO boundary files. These routines will not give correct latitude and longitude to Alaska and Hawaii since these states are located south of Arizona and California.

```

C*****
C
C PROGRAM ALBER1: TO CONVERT AN ALBERS EQUAL AREA
C   COORDINATE IN INCHES TO A GEOGRAPHIC COORDINATE
C
C*****
C   SUBROUTINE ALBER1(X,Y)
C   DATA IFIRST/0/
C
C SET UP PARAMETERS FIRT TIME THRU
C
C   IF(IFIRST.NE.0)GO TO 30
C   IFIRST=1
C   RAD=50.60
C   DEGREE=3.14159/180.
C   YMAX=79.7
C   PHI1=29.5*DEGREE
C   PHI2=45.5*DEGREE
C   CP1=COS(PHI1)
C   CP2=COS(PHI2)
C   SP1=SIN(PHI1)
C   SP2=SIN(PHI2)
C   AN=(CP1*CP1-CP2*CP2)/(2.*(SP2-SP1))
C   C2=RAD*RAD/AN
C   C1=C2*(CP1*CP1/AN+2.*SP1)
C   C2=2.*C2
C   CMERID=95.5*DEGREE
C   XXX=X-20.8
C   YYY=YMAX-Y
30   DEGX=CMERID-ATAN2(XXX,YYY)/AN
C
C CONVERT TO GEOGRAPGIC COORDINATES
C
C   Y=ASIN((((X-20.8)/SIN(AN*(CMERID-DEGX)))*2-C1)/-C2)
C   X=DEGX
C   RETURN
C   END

```

\*\*\*\*\*

PROGRAM ALBER: TO CONVERT A GEOGRAPHIC COORDINATE  
TO AN ALBERS EQUAL AREA COORDINATE IN INCHES

\*\*\*\*\*

SUBROUTINE ALBER(X,Y)  
DATA IFIRST/0/

SET UP PARAMETERS FOR THE FIRST TIME THRU

IF(IFIRST.NE.0)GO TO 30  
IFIRST=1  
RAD=50.60  
DEGREE=3.14159/180.  
YMAX=79.7  
PHI1=29.5\*DEGREE  
PHI2=45.5\*DEGREE  
CP1=COS(PHI1)  
CP2=COS(PHI2)  
SP1=SIN(PHI1)  
SP2=SIN(PHI2)  
AN=(CP1\*CP1-CP2\*CP2)/(2.\*(SP2-SP1))  
C2=RAD\*RAD/AN  
C1=C2\*(CP1\*CP1/AN+2.\*SP1)  
C2=2.\*C2  
CMERID=95.5\*DEGREE  
RHO=SQRT(C1-C2\*SIN(Y))  
THETA=AN\*(CMERID-X)

GET INCHES

X=RHO\*SIN(THETA)+20.8  
Y=YMAX-RHO\*COS(THETA)  
RETURN  
END