

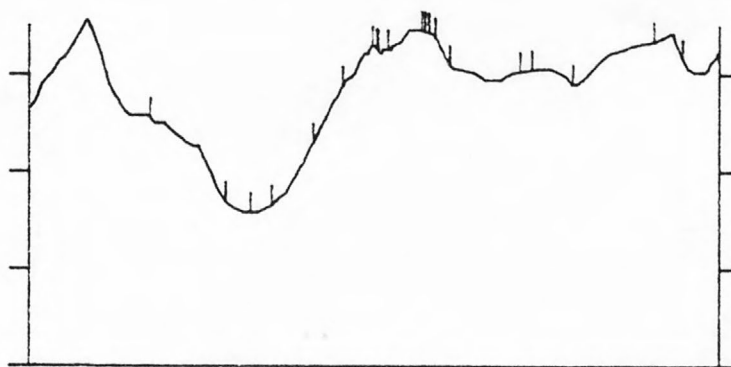
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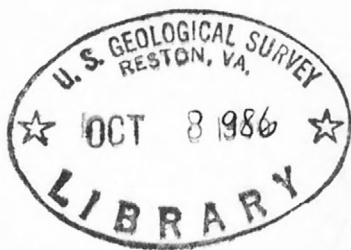
UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

GSSECT VERSION 1.0: A PROTOTYPE PROGRAM FOR THE IBM PC OR COMPATIBLE  
MICROCOMPUTERS TO ASSIST DRAWING OF CROSS SECTIONS

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*the area*



Open-File Report  
86-446A  
Program Disk  
86-446B

*Open-file report  
(Geological Survey)  
U.S.))*

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Although program tests have been made, no guarantee (expressed or implied) is made by the authors or the U.S. Geological Survey regarding program correctness, accuracy, or proper execution on all computer systems.

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Computer Disk Collection*

Denver, Colorado  
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## INTRODUCTION

GSSECT is a prototype program for the IBM PC and compatible microcomputers to enable quick and accurate drafting of the topographic profile for cross sections. This job is a chore not relished by most geologists and, with conventional drafting techniques, beset with pitfalls leading to inaccuracies. The use of a precise digitizer for input of data and plotter to draw the section eliminates most of these problems, and speeds the entire process. The equipment used is the same as that specified for GSDRAW and GSMAP Version 3.0, and files are produced that are designed for use with the GSDRAW drafting program, Version 3.0. The source code and executable programs are supplied on the release disk that accompanies this documentation.

## OPERATING THE PROGRAM GSSECT

### Starting

The geologic map with topographic base should be firmly fastened to the digitizer table, the computer, digitizer and plotter should be turned on, and the line of section clearly drawn on the map before starting.

GSSECT is invoked by entering the name of the program: the title screen is seen first.

G S S E C T

Version 1.0

Gary I. Selner  
U.S. Geological Survey

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Press any key to continue.

Pressing any key will bring up the menu screen.

# Menu GSSECT

G S S E C T

CURRENT SECTION:

- 1 - START A NEW SECTION
- 2 - OPEN AN EXISTING SECTION
- 3 - DIGITIZE PROFILE AND CONTACTS
- 4 - LIST SECTION VALUES ON THE PRINTER
- 5 - PLOT ON THE HARD COPY PLOTTER
- 6 - EXIT

ENTER CHOICE BY NUMBER:

## Start a new section

Entering 1 from the menu will start a new section. The prompt on screen will request entry of a name for this section:

ENTER FILENAME OF SECTION: **CLIMAX**

Entry of the section name will cause return to the Menu screen, unless the section name has already been used: a "Y" answer will overwrite the older file, a "N" answer will prompt a call for a section name.

ENTER FILENAME OF SECTION: **CLIMAX**

A FILE WITH THE SAME NAME ALREADY EXISTS

DO YOU WANT TO CONTINUE?(Y/N): **Y**

## Open an existing section

Entering 2 from the menu will call a request for the name of the existing section needed. Such a request will usually be made in order that additional plots can be made. No provision has been made for entry of new data once a section has been completed. Do not enter the file extension.

ENTER FILENAME OF SECTION: **CLIMAX**

Entering the name of the section will cause return to the menu.

### Note:

- Data for the section is stored in a file with the name of the section, with extension SEC, ie. **CLIMAX.SEC**

## Digitize profile and contacts

Entering 3 from the menu will start the process of entering data for the new section. Follow the directions on the screen:

ENTER ELEVATION OF STARTING POINT: 12060 (Keyboard entry)  
ENTER CONTOUR INTERVAL: 40 (Keyboard entry)

ENTER 0(ZERO) KEY ON CURSOR KEYPAD TO SYNCHRONIZE DIGITIZER INPUT  
- Entering "0" on the keypad at any point on the digitizer, normally twice, will synchronize the digitizer and the computer, so that the process of digitizing section information can start.

ENTER STARTING POINT ON DIGITIZER USE 0 KEY (Keypad entry)

Entering a "0" from the keypad at the starting point of the section on the map will cause the screen to clear, and new directions will be seen:

ENTER INTERSECTION OF SECTION WITH CONTOUR  
USE 0 KEY TO INDICATE INCREASING ELEVATION  
USE 1 KEY TO INDICATE SAME AS PREVIOUS CONTOUR  
USE 2 KEY TO INDICATE DECREASING ELEVATION  
USE 3 KEY TO ENTER INFLECTION POINT LOCATION  
ENTER ELEVATION VALUE ON KEYPAD  
USING NUMERIC KEYS (6 DIGITS MAXIMUM)  
IF LESS THAN 6 DIGITS USE 'A' KEY TO END  
ELEVATION VALUE  
USE 4 KEY TO INDICATE END OF SECTION

After a "4" is used from the keypad, a request will be seen for the elevation of the end of the section:

ENTER ELEVATION OF LAST POINT 1460 (Keyboard entry)

The screen will clear, and new directions will be seen:

USE 0 KEY TO ENTER CONTACT LOCATIONS (Keypad entry)  
USE 1 KEY TO STOP (Keypad entry)

This phase of data entry is ended with the "1" key (keypad); this final "1" entry does not enter a location on the section and will cause the system to return to the menu screen.

### Notes:

- During digitizing of the topographic profile, a "beep" will be sounded at entry of each point. The sound will be higher in pitch for all elevations ending in "00" to help the user keep on track, and reduce the chance for error.
- The "contact locations" requested are the locations along the line of section where tick marks will be needed to assist adding geologic information to the final section, including intersections with geologic contacts, faults, and other needed locations.

## List section values on printer

Entry of a 4 from the menu will obtain a listing of data for the section. Data will be provided in three parts:

- (1) SECTION FILENAME: CLIMAX (Name of file)
- (2) PROFILE DATA (X,Y coordinates of points on topographic profile in inches, 0,0 is set at initial point on section)
- (3) CONTACT DATA (X,Y coordinates of points where tick mark will be drawn on section)

SECTION FILENAME= CLIMAX.SEC

### PROFILE DATA

PT,	0.000	11460	PT,	1.848	11280
PT,	0.101	11480	PT,	1.885	11320
PT,	0.289	11520	PT,	1.958	11360
PT,	0.694	11560	PT,	2.027	11400
PT,	1.025	11600	PT,	2.071	11440
PT,	1.099	11640	PT,	2.113	11480
PT,	1.186	11600	PT,	2.153	11520
PT,	1.216	11560	PT,	2.183	11560
PT,	1.234	11520	PT,	2.224	11600
PT,	1.248	11480	PT,	2.247	11640
PT,	1.263	11440	PT,	2.270	11680
PT,	1.282	11400	PT,	2.323	11720
PT,	1.321	11400	PT,	2.347	11760
PT,	1.382	11440	PT,	2.369	11800
PT,	1.394	11440			
PT,	1.423	11400			
PT,	1.455	11360			
PT,	1.529	11320			
PT,	1.548	11280			
PT,	1.581	11240			
PT,	1.678	11240			
PT,	1.706	11280			
PT,	1.765	11280			
PT,	1.790	11240			
PT,	1.804	11240			

### CONTACT DATA

PT,	0.704	11561
PT,	0.826	11576
PT,	0.889	11584
PT,	1.576	11246
PT,	1.683	11247
PT,	2.224	11600

## Plot on the hard copy plotter

Entry of a 5 from the menu starts the process of obtaining a plot of the section.

```
ENTER BASE ELEVATION, TOP ELEVATION: 9000, 14000
ENTER HORIZ SCALE, VERT SCALE, TICK INTERVAL: 1, 2000, 500
ENTER XOFF, YOFF: 1, 1
ROTATE?(Y/N) N
ENTER PEN, SPEED, FORCE: 1, 25, 1
```

The BASE and TOP elevations refer to the elevations of the desired bottom and top of the end lines of the drafted section.

The HORIZ SCALE (HORIZONTAL SCALE) is input as a factor:

Example: a "1" would plot data digitized from a 1:24,000 scale map at map scale, a "2" would plot the same data at 1:48,000 scale (two times the 24,000 scale).

The VERT SCALE (VERTICAL SCALE) is entered as the number of feet per inch. (A 1:1 (vertical:horizontal) plot from a 1:24,000 scale map would require entry of 2000).

The TICK INTERVAL entered specifies the vertical distance in feet desired between tick marks on the beginning and end lines of section.

The XOFF, YOFF requested are "offsets", designed to move the entire section to a new place on the plotting medium. The desired offset in X and in Y are entered in inches and decimal inches to position the section. X is positive measured "up" with respect to the lower left corner of the section, Y is positive measured from the lower left corner of the section.

In the example above, digitized from a 1:24,000 scale map, the section will be drawn at 1:1 (no vertical exaggeration, with marks at the ends of the section 500 feet (at 2,000"/inch) apart.

```
ROTATE?(Y/N) N
```

- "ROTATE" A "Y" or "N" answer is needed, and sets the plotter X and Y axes relative to the plot. Check the plotter manual for rotation instructions.

```
ENTER PEN, SPEED, FORCE: 1, 25, 1
```

- "PEN" Specify the number of the pen to be used (position in the carousel).

- "SPEED" Specify the speed in cm/sec to be used.

- "FORCE" Specify pen force (a number from 1 to 8 that will set the pen force in grams)



Settings of pen speed and force vary with pen type: default settings indicated by Hewlett-Packard are given in parentheses

	PEN SPEED	FORCE PARAMETER
Fiber	25 (50)	1 (2)
Roller	30 (60)	3 (6)
Refillable ink pens	15 (30)	1 (2)
Disposable ink pens	15 (15)	1 (2)

(Force parameter)	1 = 10g	4 = 34g	7 = 58g
	2 = 18g	5 = 42g	8 = 60g
	3 = 26g	6 = 50g	

After the entry of PEN,SPEED,FORCE, the section will be drawn on the plotter. It is now possible to save this digital data in the form of a GSDRAW plot file. The screen prompt will ask -

SAVE PLOTTED SECTION TO GSDRAW DATABASE?(Y,N):

- A "N" (no) answer will return the system to the menu screen.
- A "Y" (yes) answer will call prompts:

ENTER DATABASE NAME:AA

ENTER TITLE:AA

The system will generate files with the DATABASE NAME specified which are GSDRAW files. In these files:

Line code 91 will be used for the vertical and horizontal lines that frame the section.

Line code 92 will be used for the tick marks along the sides of the section.

Line code 93 will be used for the vertical tick marks that mark the intersections of the profile with contacts or other features.

Line code 94 will be used for the topographic profile.

Plotting the section in draft mode will provide the index corners for the GSDRAW model that will enable addition of lines, symbols, patterns, etc. to the GSDRAW file to complete the cross section.

Note:

- If the section is to be used for a GSDRAW file, using an offset such as 1,1 (an inch in X, an inch in Y) will provide needed space to permit plotting of all parts of the diagram, including tick marks on the ends of the section, and vertical elevation numbers which may be added later.



## Exit

Entry of a 6 from the menu will return the system to the DOS prompt.

## CONFIG.CAD

A file named "CONFIG.CAD" is included for use with the GSSECT.EXE program to set proper communications between computer, plotter, and digitizer. This file contains two lines of text enclosed in quotes. The first line applies to the digitizer, the second to the plotter. In each line the text specifies the synchronous communication port that the device is attached to, the transmission speed (baud) and other parameters that apply to communication between hardware device and computer. The user is referred to the OPEN COM .. statement in the IBM Basic manual for explanation of these parameters. Normally the user would not change the contents of this file, which look like the example below.

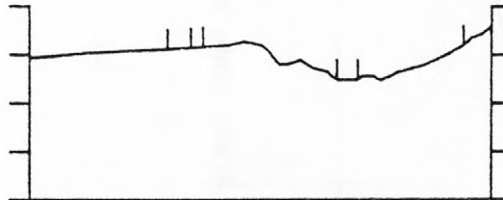
```
"COM2:1200,N,8,1"
```

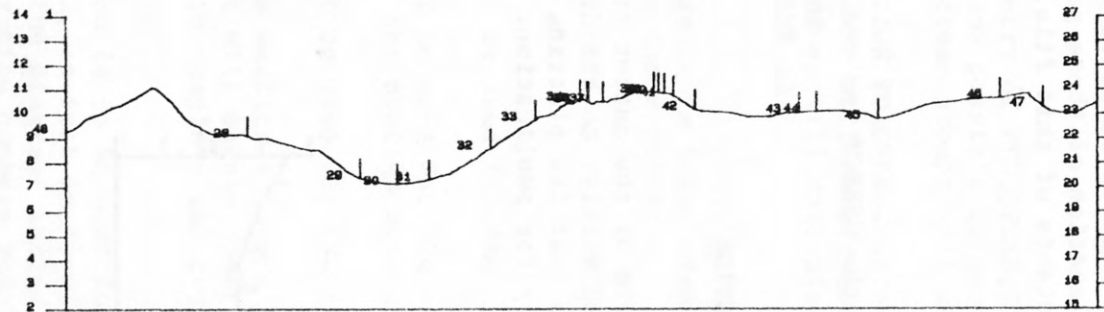
```
"COM1:9600,N,8,1,RS,CS65535,DS,CD"
```

The same CONFIG.CAD file is used for the GSSECT and the GSDRAW and GSMAP programs (Version 3.0).

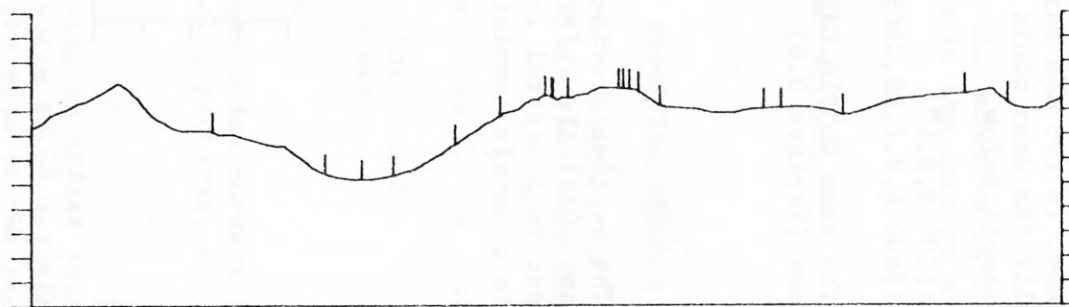
## SAMPLE SECTION

The section provided here is an example of the output from the GSSECT program. Geologic information can be added easily, to the drafted section, then put into digital form using GSDRAW so that its plotting capacity can be used to generate complete and finished copy for publication.





Draft mode plot, GSDRAW, from file generated by GSSECT



Original plot from GSSECT



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