III.8-TAPLOT TEMPERATURE-ELEVATION PLOTTING PROGRAM (TAPLOT)

Purpose

The Temperature-elevation Plotting program (TAPLOT) prints plots of temperature versus elevation on a monthly basis.

The plots:

- are needed only when computing MAT in mountainous areas
- assist in determining the variations in temperature over a mountainous area
- are used to help determine the appropriate mean monthly maximum and minimum temperatures to be assigned to a synthetic maximum-minimum temperature station

Program Input

The program uses free format input for all cards.

Free Format Input Rules

See Chapter I.3-FREEFMT-UFIELD for a description of the general syntax rules.

Syntax rules specific to program TAPLOT are:

1. The '@' indicates a card label. Card labels can be on the same line or the line above the fields of the card. For example:
   ```
   @A 10 1965 10 1966
   ```
   can be specified as
   ```
   @A
      10 1965 10 1966
   ```

2. If a card is not needed for a particular run then the label and all fields must be omitted.

3. Not all letters are used as card labels. For example there is no card K.

4. Character fields containing commas and embedded blanks must be enclosed by apostrophes. Note that station names (card F, field 1) generally contain blanks.

5. All fields are required. Double commas must be used to denote single fields for which default values are to be used. If N consecutive fields use default values then N+1 commas must be used. The following input implies that defaults are to be used for the first two fields on card B:
   ```
   @B ,,,
   ```

6. Not all fields have valid defaults. If the documentation does not specify a default then the input must be specified.

Input Data

Card	Field	Format	Contents
A	1		'@A'
	2	I	Number of stations to be plotted (maximum is 26)
	3	A	Units used for data input and display: 'METR' = metric system (default) 'ENGL' = English system
	4	A60	Heading information
	5	R	Maximum elevation to be used in scaling the plot 1/
	6	R	Minimum elevation to be used in scaling the plot 1/
Repeat cards F, G and H for each station. 2/			
F	1		'@F'
	2	A20	Station name
	3	R	Station latitude
	4	R	Station longitude
	5	R	Observation time for initial month in local standard time (hours 1 to 24) (this value cannot be 0.0)
	6	R	Station elevation in meters or feet
	7	A	Dummy station option 'DUMMY' = dummy station
G	1		'@G'
	2	R	Elevation weighting factor for maximum temperature
	3-14	R	Mean maximum temperature for each month (January through December) in units of DEGC or DEGF
H	1		'@H'

Card	Field	Format	Contents
	2	R	Elevation weighting factor for minimum temperature
	3-14	R	Mean minimum temperature for each month (January through December) in units of DEGC or DEGF

Notes:

1/ Default values for are determined from the input data. When the user supplies these values the range must include the entire range of elevations on all F cards.

2/ Cards F through H have the same format specification as input cards F through H for the Mean Areal Temperature (MAT) program. MAT cards F through H contain some additional entries not required by TAPLOT but these cards can be used as input to both programs. On card F only fields 1 and 5 are required.

Monthly mean maximum and minimum temperatures needed for cards G and H can be obtained from the summary produced by program DLYTRAN.

Field 1 on cards G and H is not required in TAPLOT and may be represented by default values. The cards produced by DLYTRAN contain default values for the weighting factor.

The plotting symbols for each station (letters A through Z) are determined by the input order of cards F through H. The elevation range of the plots is determined by the program and is always some multiple of 1000 M or FT. The temperature range is always 50 DEGC (0.5 DEGC per line) or 100 DEGF (1.0 DEGF per line) with the minimum temperature being computed by the program on a monthly basis.

Program Execution Information

See Chapter I.2 for information about how to execute the program.

Sample Input and Output

Figure 1 is sample program input.

Figure 2 is sample program output.

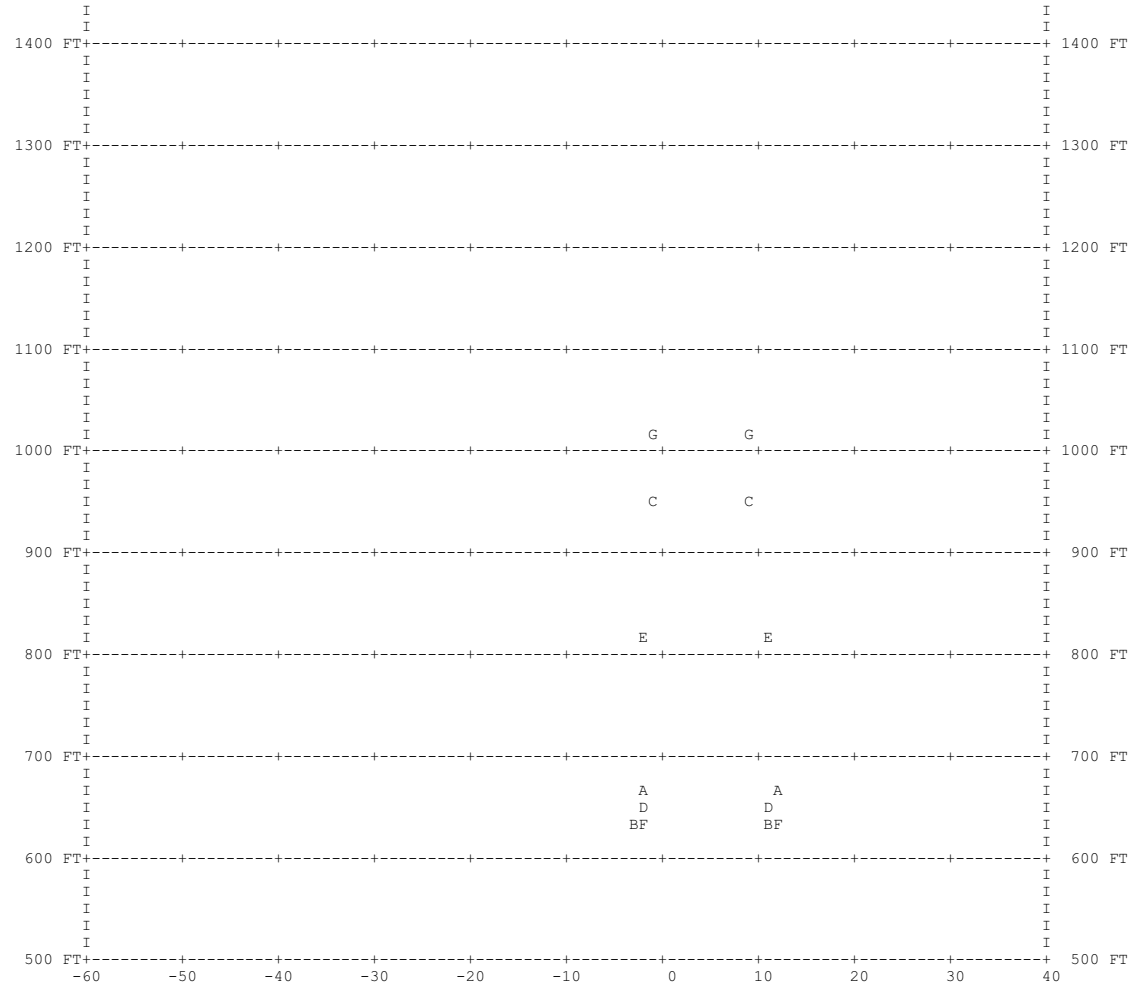
Figure 1. Sample input for program TAPLOT

```
$ SAMPLE INPUT FOR PROGRAM TAPLOT

@A  7 ENGL 'FRENCH BROAD RIVER ABOVE BLANTYRE, NC' ,,,

@F  'BREVARD, NC'            35.23  82.73  18.  660.
@G   50.  9.5 11.9 14.9 21.2 25.0 27.5 29.1 29.0 25.8 21.0 15.5 10.3
@H   50. -4.5 -2.5 -0.0  5.1  9.6 13.5 15.7 15.4 12.2  5.5 -0.2 -4.0

@F  'PISGAH FOREST 1N, NC'   35.27  82.70  18.  640.
@G   50.  8.9 10.8 14.1 20.4 24.5 26.8 28.4 28.3 25.4 20.8 15.3  9.8
@H   50. -4.5 -2.7 -0.2  5.2  9.5 13.2 15.4 15.1 12.0  5.3  0.0 -3.8

@F  'CAESARS HEAD, S.C.'     35.10  82.62  18.  950.
@G   50.  6.9  8.9 11.9 18.3 22.1 24.4 26.0 25.8 22.6 17.8 12.6  7.6
@H   50. -2.1 -0.9  1.6  7.7 12.4 15.3 17.3 17.1 14.3  8.8  3.6 -1.1

@F  'HENDERSONVILLE, NC'     35.33  82.44  18.  655.
@G   50.  8.8 11.2 14.3 21.2 25.2 27.6 29.1 29.0 25.7 20.3 14.7  9.9
@H   50. -4.1 -2.5  0.2  5.6  9.9 13.5 16.1 15.4 12.2  5.4  0.5 -3.2

@F  'WAYNESVILLE 1E, NC'     35.48  82.47  18.  810.
@G   50.  8.4 10.8 13.7 20.2 23.8 26.3 27.7 27.7 24.9 20.0 14.5  9.3
@H   50. -4.3 -2.3  0.2  5.6  9.2 12.8 15.1 14.4 11.3  4.9  0.1 -3.4

@F  'CULLOWHEE, NC'          35.33  83.10  19.  640.
@G   50. 10.2 12.3 15.3 21.6 25.6 27.8 29.4 29.4 27.0 22.2 16.5 10.7
@H   50. -4.0 -1.9  0.4  5.5  9.7 13.8 16.4 15.9 12.6  5.7 -0.1 -3.3

@F  'HIGHLANDS 2S, NC'       35.06  83.30  18.  1015.
@G   50.  7.0  8.7 11.4 17.8 21.5 23.3 24.9 24.9 22.0 17.4 12.6  7.7
@H   50. -2.7 -1.2  0.9  6.3 10.8 13.9 15.8 15.7 13.3  7.0  2.3 -1.9
```

Figure 2. Sample output from program TAPLOT

```
NWSRFS CALIBRATION SYSTEM - PROGRAM TAPLOT   (VERSION: 1.0.11   - 01/20/99)              DATE=Feb 24, 1999 - 09:16:34

>>>>>>>>>>  $ SAMPLE INPUT FOR PROGRAM TAPLOT                                             1  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                             2  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                             4  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                             8  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                            12  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                            16  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                            20  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                            24  <<<<<<<<<<<<<<<<<<<<<<
>>>>>>>>>>                                                                            28  <<<<<<<<<<<<<<<<<<<<<<

MONTHLY MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIPS FOR FRENCH BROAD RIVER ABOVE BLANTYRE, NC

                      SYMBOL         STATION NAME             ELEVATION(FEET)
                         A       BREVARD, NC                        660.
                         B       PISGAH FOREST 1N, NC               640.
                         C       CAESARS HEAD, S.C.                 950.
                         D       HENDERSONVILLE, NC                 655.
                         E       WAYNESVILLE 1E, NC                 810.
                         F       CULLOWHEE, NC                      640.
                         G       HIGHLANDS 2S, NC                  1015.

MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR JAN.     FRENCH BROAD RIVER ABOVE BLANTYRE, NC

      -60       -50       -40       -30       -20       -10         0        10        20        30        40
1500 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1500 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
1400 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1400 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
1300 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1300 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
1200 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1200 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
1100 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1100 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                   G         G                                     I
1000 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1000 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                    C        C                                     I
       I                                                                                                   I
       I                                                                                                   I
 900 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  900 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                   E          E                                    I
 800 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  800 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
 700 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  700 FT
       I                                                                                                   I
       I                                                   A            A                                  I
       I                                                   D           D                                   I
       I                                                   F           BF                                  I
       I                                                                                                   I
 600 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  600 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
 500 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+  500 FT
      -60       -50       -40       -30       -20       -10         0        10        20        30        40

                                          TEMPERATURE-(DEGREES FAHRENHEIT)

MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR FEB.     FRENCH BROAD RIVER ABOVE BLANTYRE, NC

      -60       -50       -40       -30       -20       -10         0        10        20        30        40
1500 FT+---------+---------+---------+---------+---------+---------+---------+---------+---------+---------+ 1500 FT
       I                                                                                                   I
       I                                                                                                   I
       I                                                                                                   I
```

Figure 2. Sample output from program TAPLOT (continued)



MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR MAR. FRENCH BROAD RIVER ABOVE BLANTYRE, NC

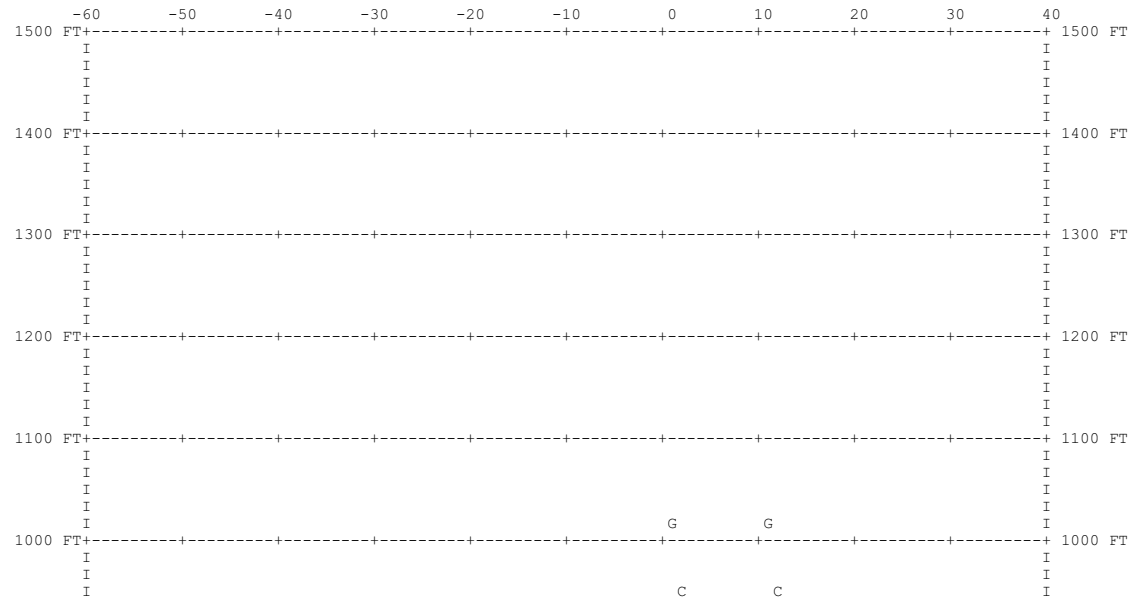
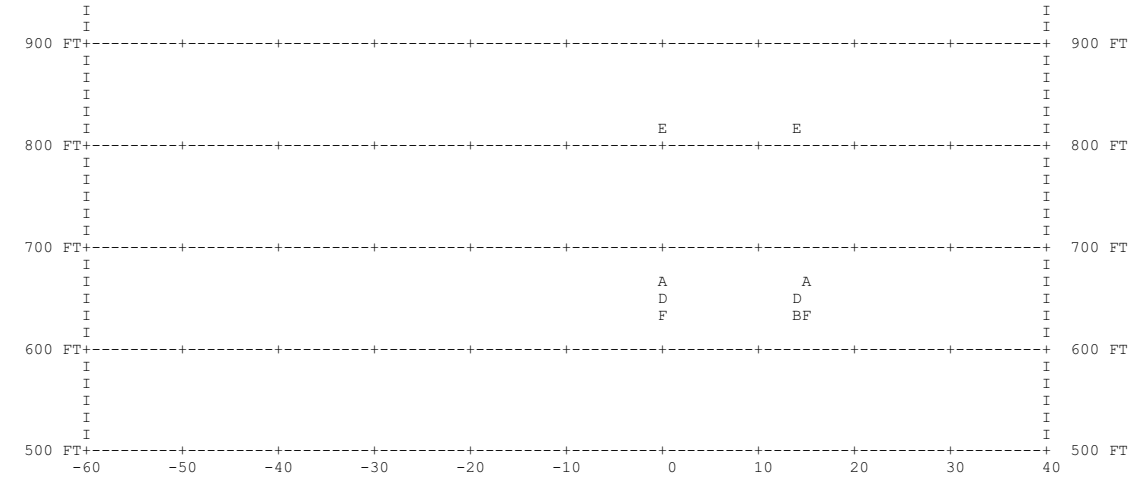


Figure 2. Sample output from program TAPLOT (continued)



MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR APR. FRENCH BROAD RIVER ABOVE BLANTYRE, NC

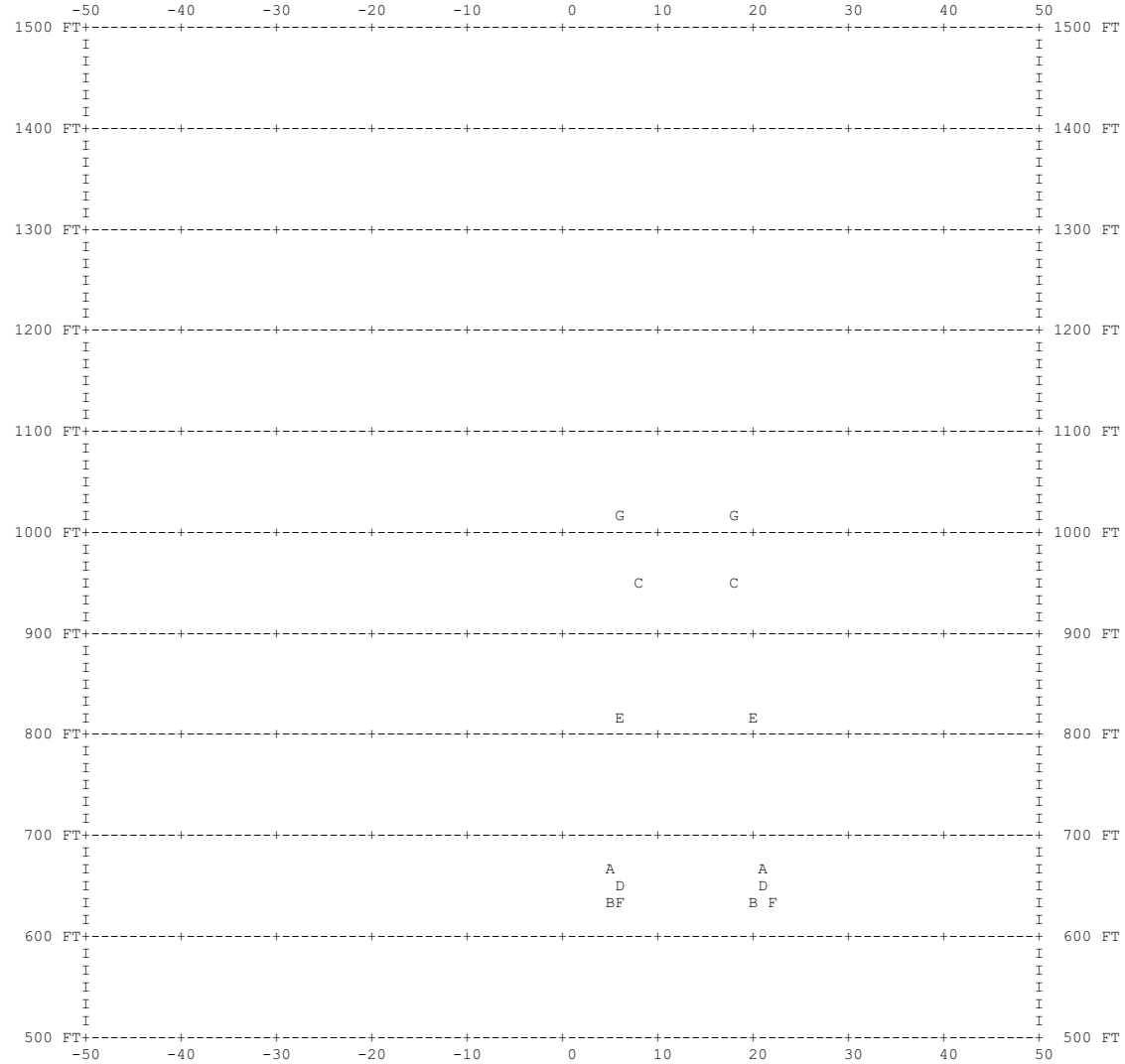


Figure 2. Sample output from program TAPLOT (continued)

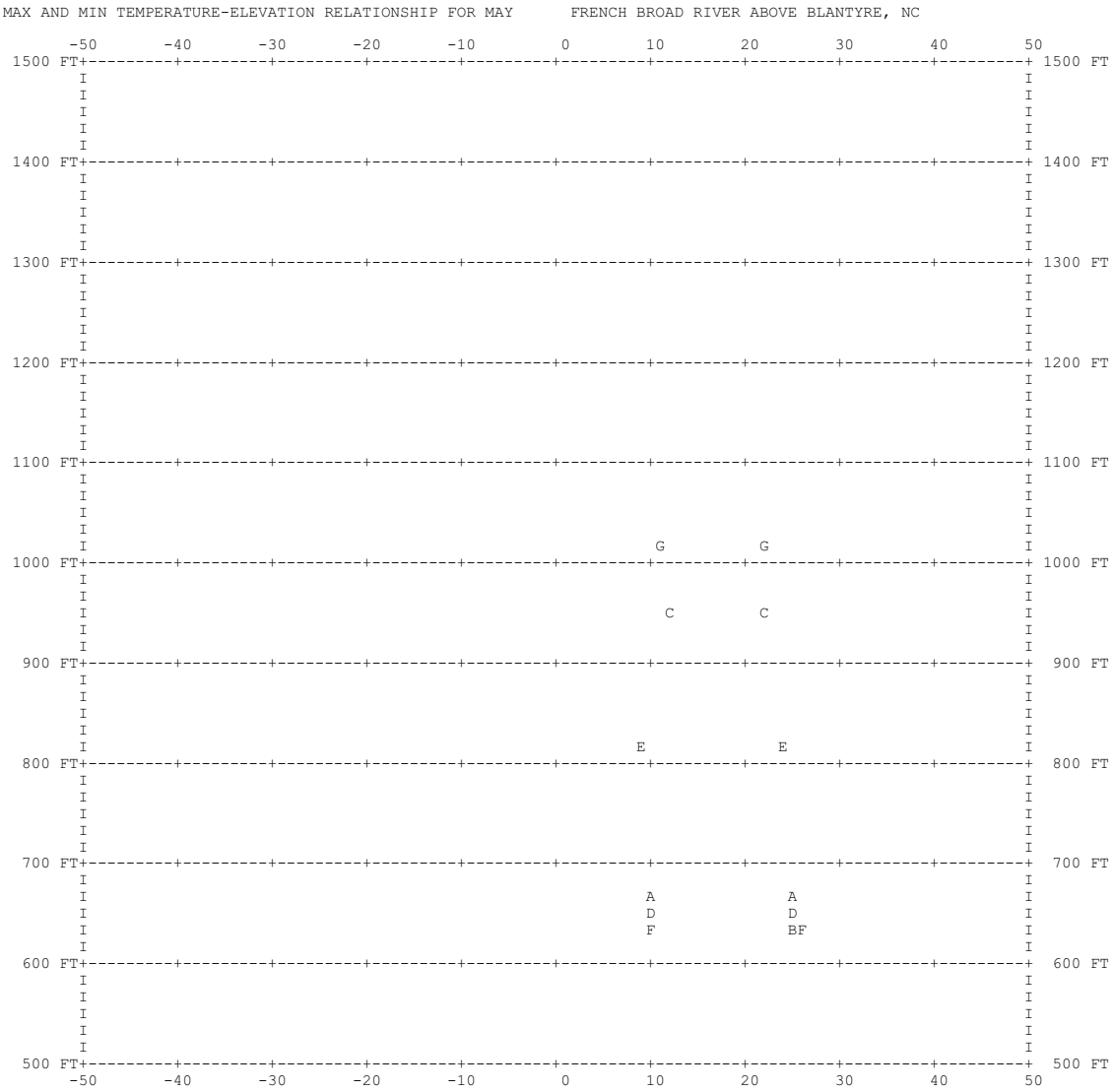
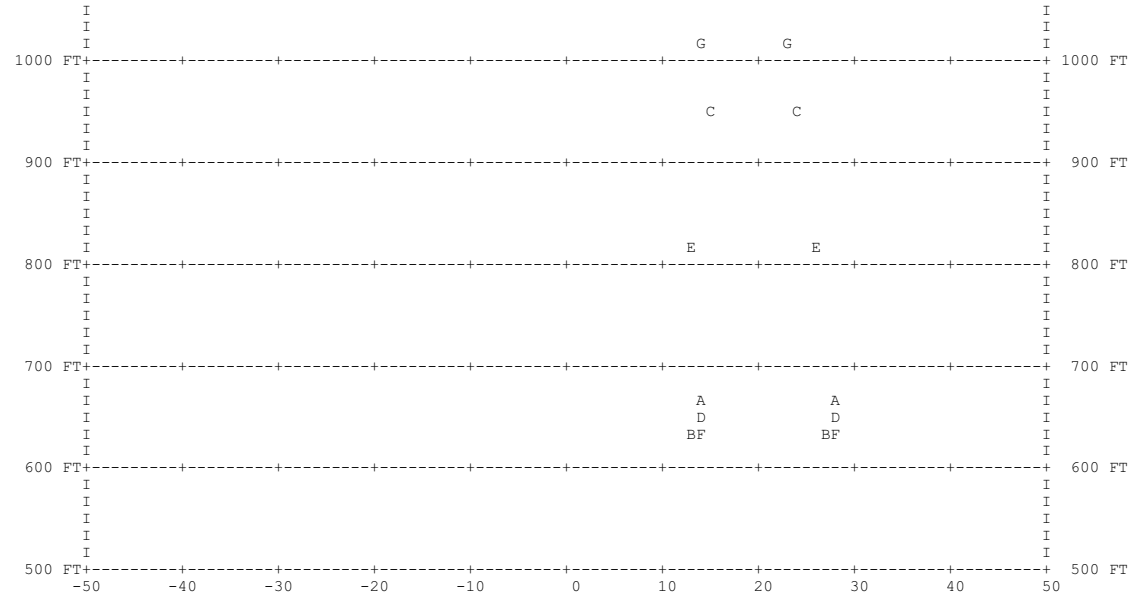


Figure 2. Sample output from program TAPLOT (continued)



TEMPERATURE-(DEGREES FAHRENHEIT)

MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR JULY FRENCH BROAD RIVER ABOVE BLANTYRE, NC

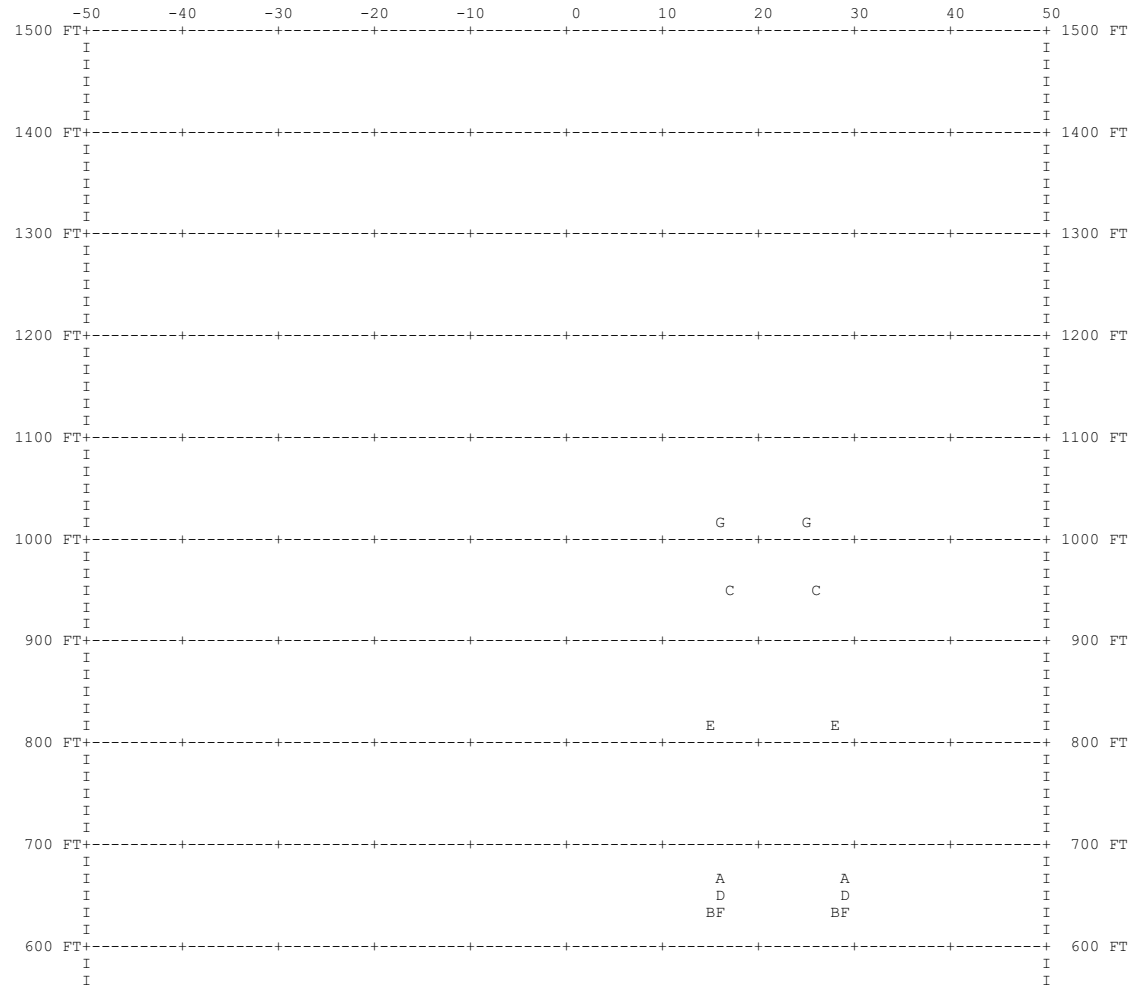
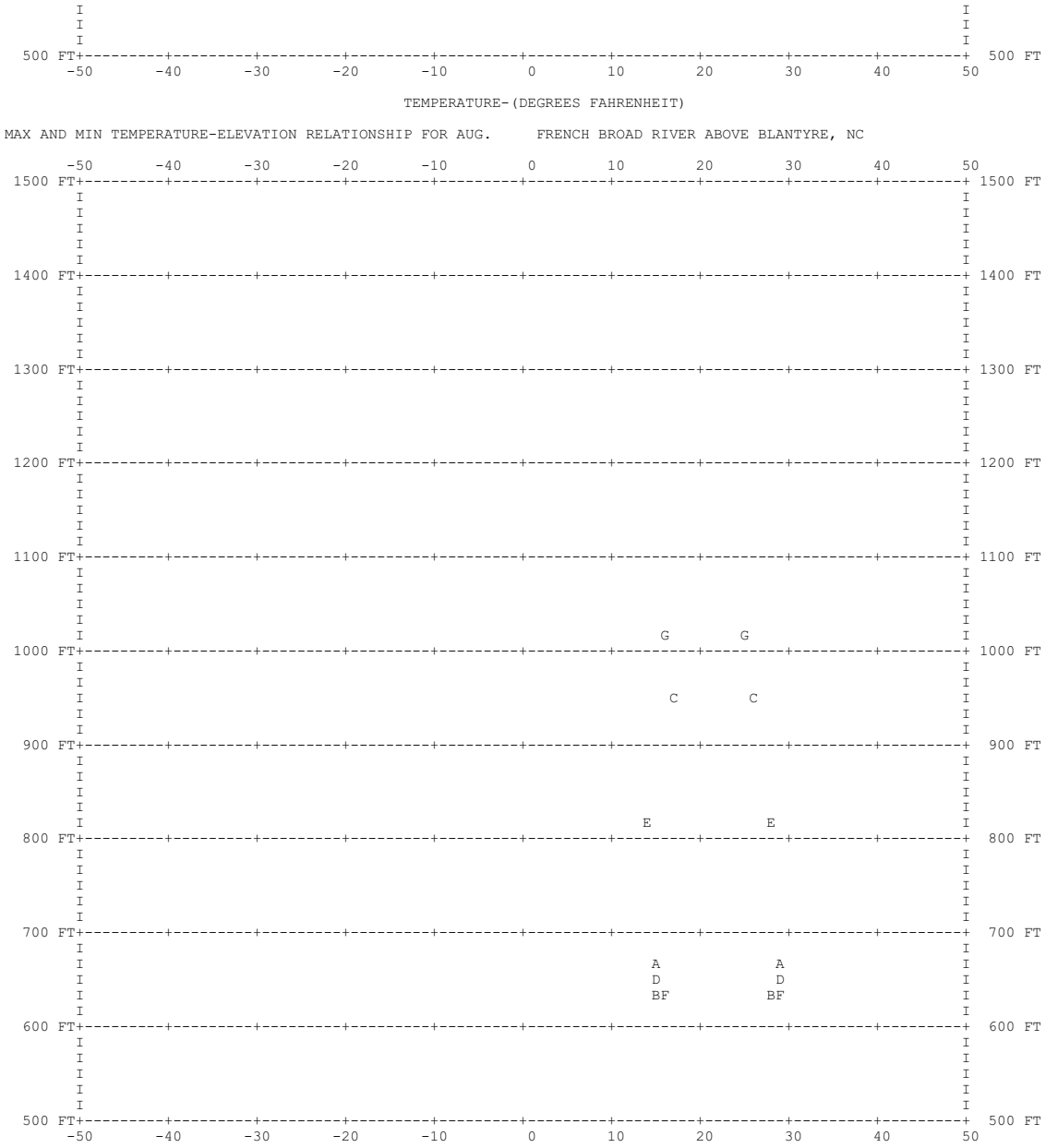


Figure 2. Sample output from program TAPLOT (continued)



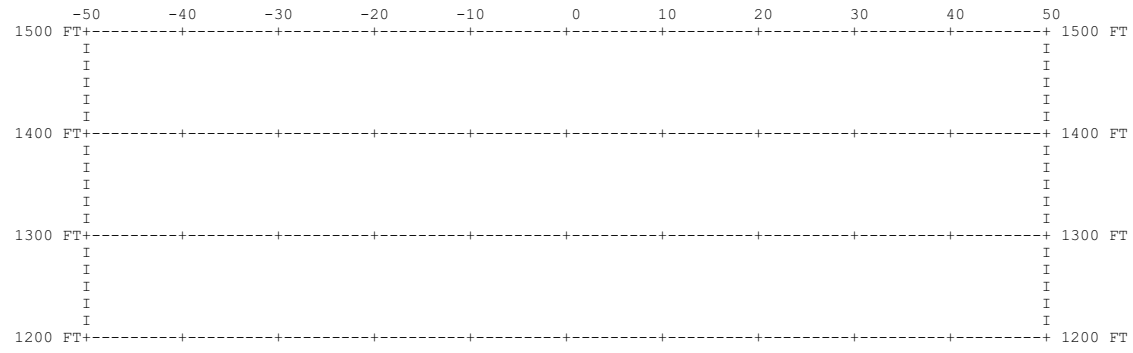
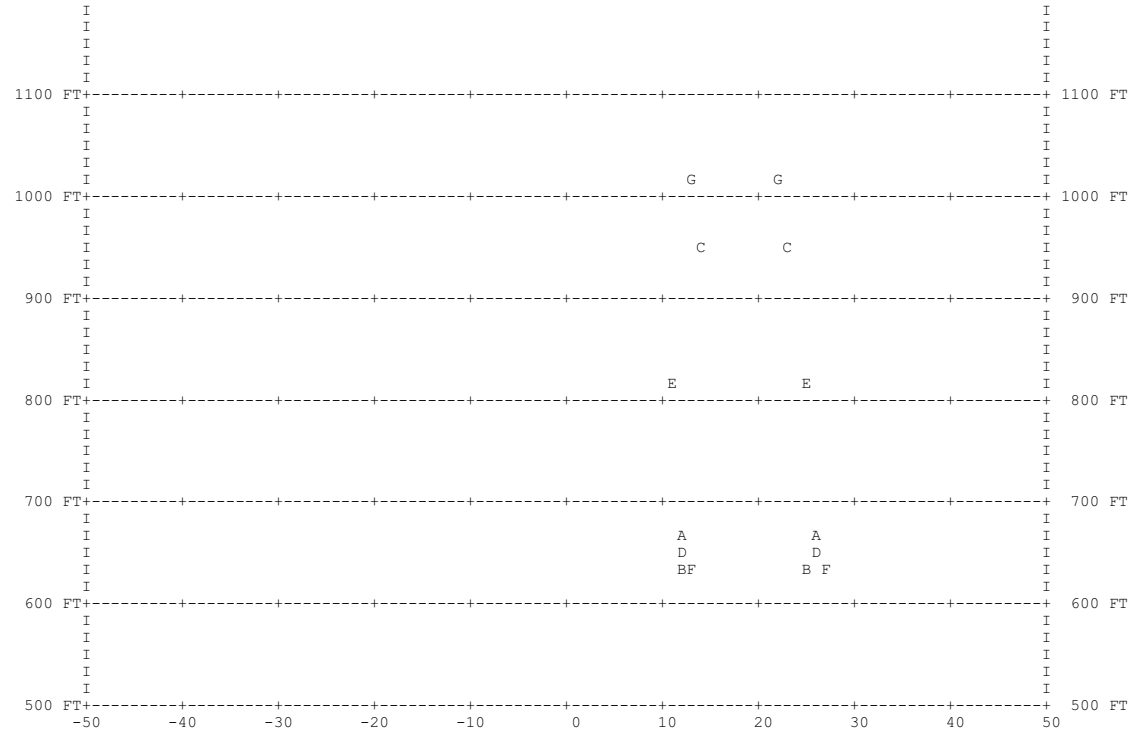


Figure 2. Sample output from program TAPLOT (continued)



MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR OCT. FRENCH BROAD RIVER ABOVE BLANTYRE, NC

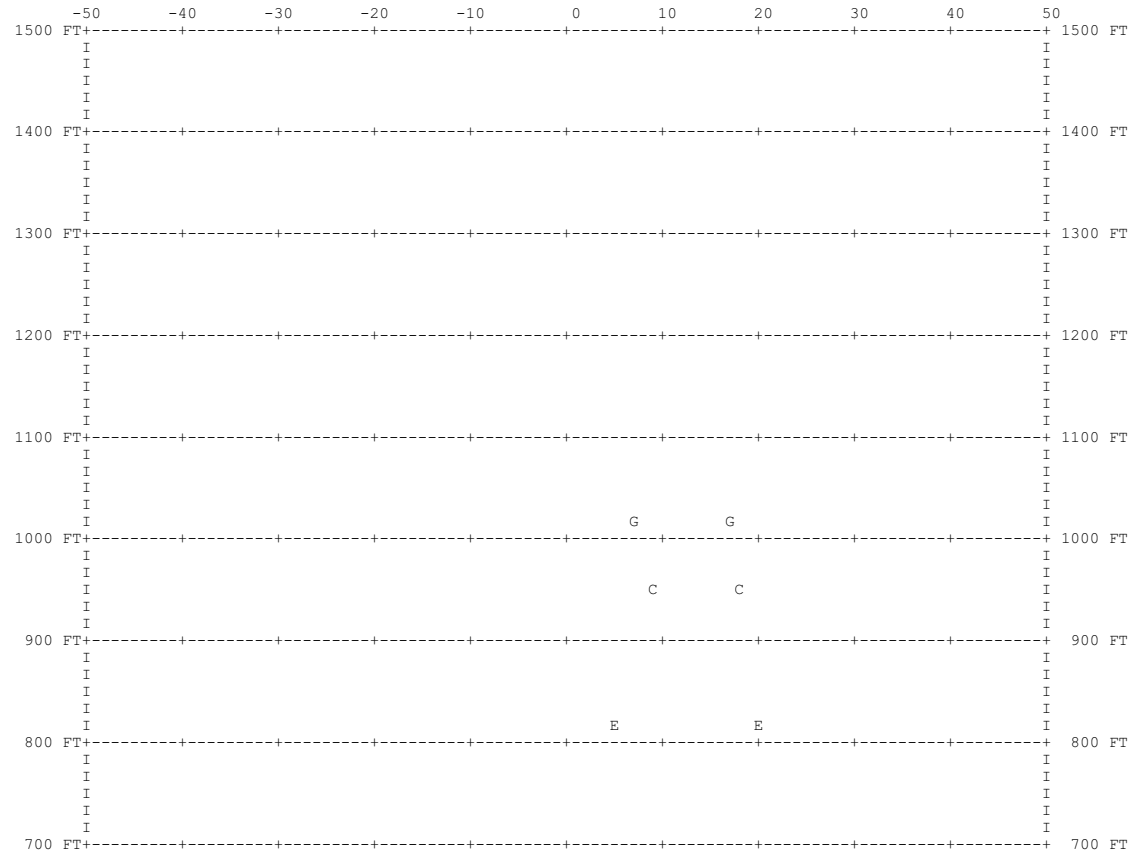
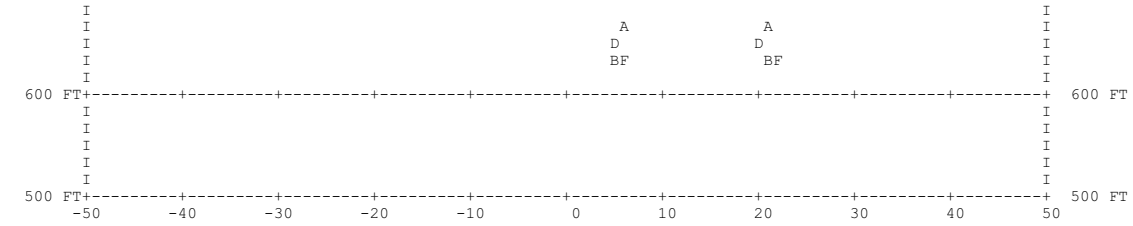
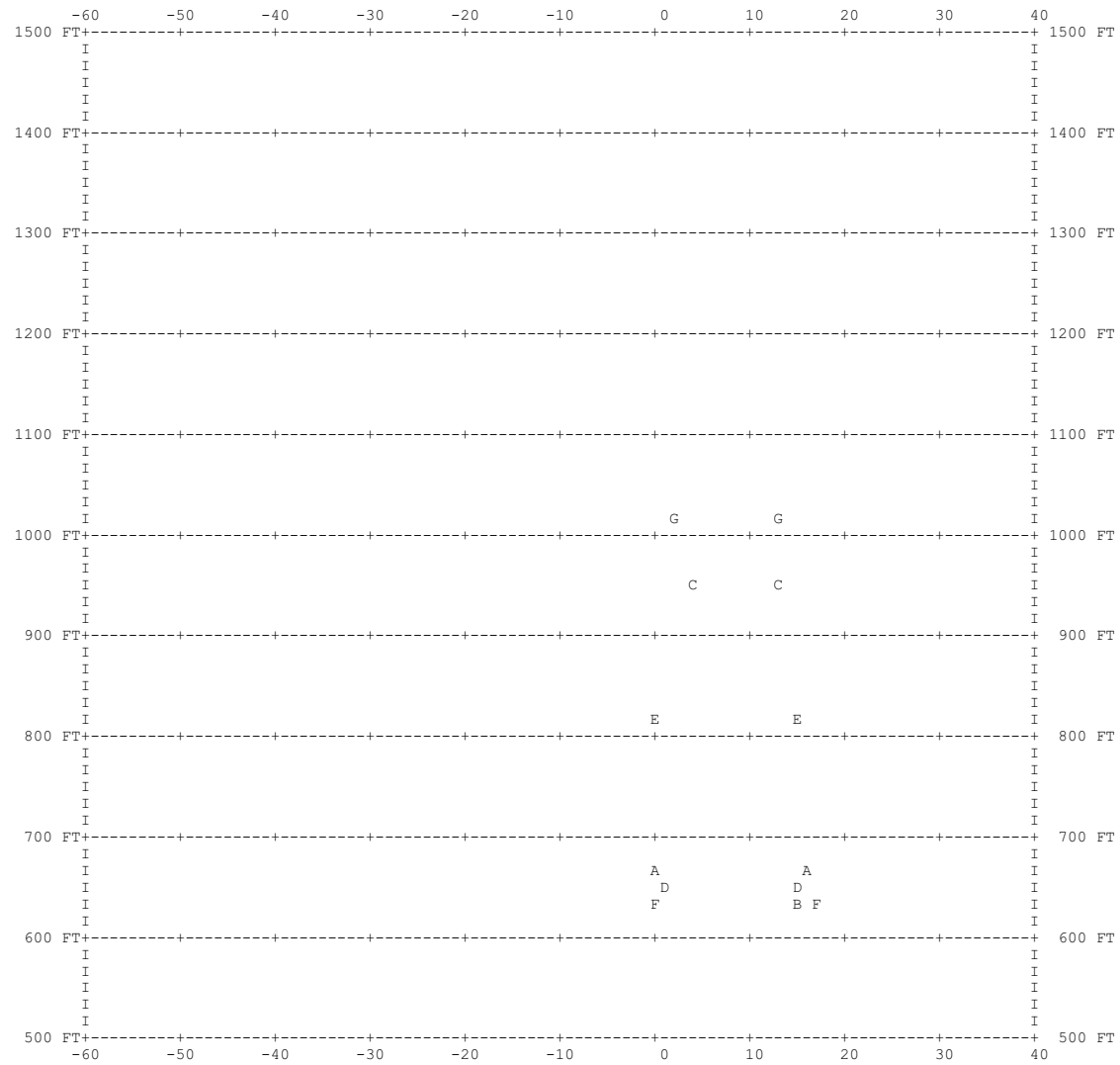


Figure 2. Sample output from program TAPLOT (continued)



MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR NOV. FRENCH BROAD RIVER ABOVE BLANTYRE, NC



MAX AND MIN TEMPERATURE-ELEVATION RELATIONSHIP FOR DEC. FRENCH BROAD RIVER ABOVE BLANTYRE, NC

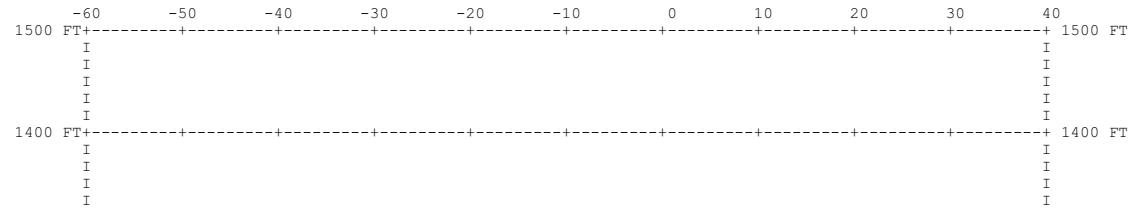
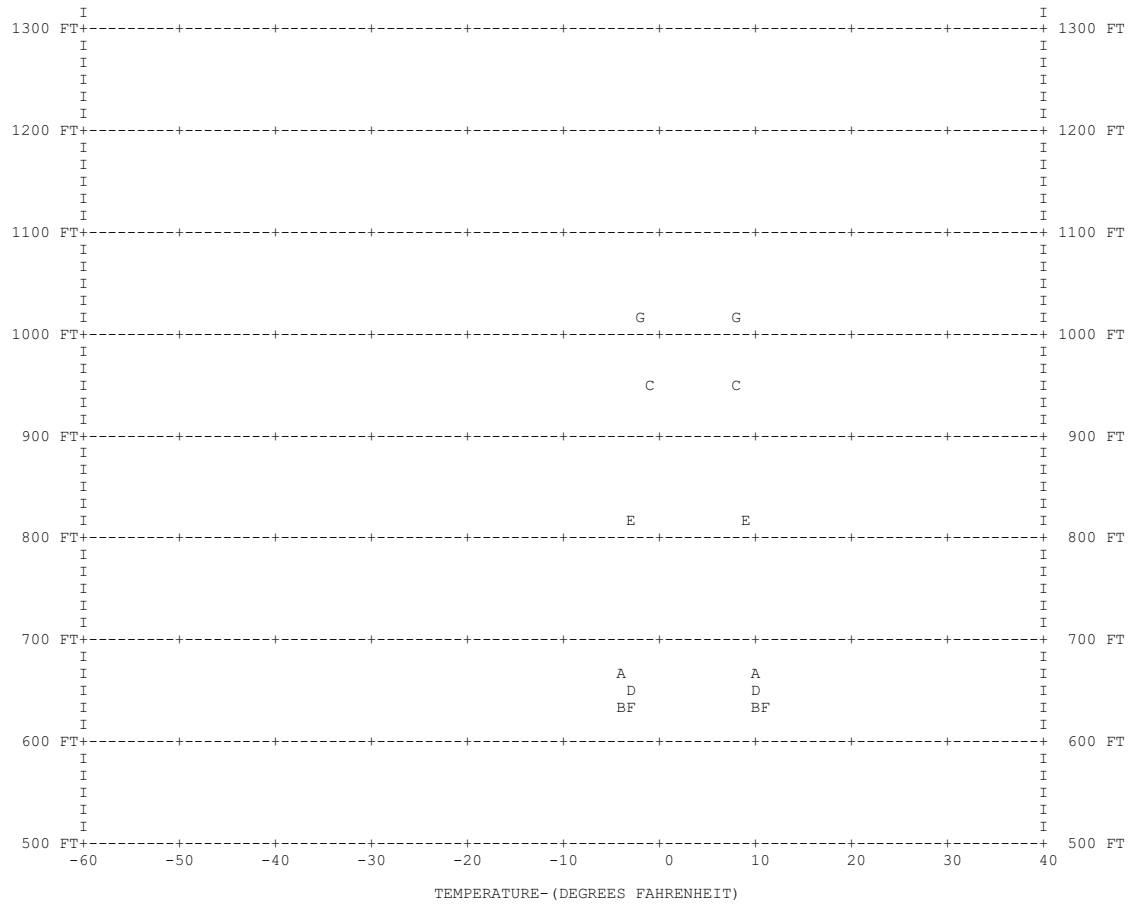


Figure 2. Sample output from program TAPLOT (continued)




```
**********************************************************************************************************************************

             COMPLETION CODE =  0

             CPU   TIME USED =    0 MINUTES,  1 SECONDS

             CLOCK TIME USED =    0 MINUTES,  1 SECONDS

**********************************************************************************************************************************
```