SFMAP plots surface station data on a map.

**INPUT PARAMETERS** (* denotes parameters that will be used most often)

*AREA      Data area
*GAREA     Graphics area
SATFIL     Satellite image filename(s)
RADFIL     Radar image filename(s)
IMCBAR     Color/ornt/anch/x;y/ln;wd/freq
*SFPARM    Surface parameter list
*DATTIM    Date/time
*SFFILE    Surface data file
COLORS     Color list
MAP        Map color/dash/width/filter flag
MSCALE     fgc;bgcolor;mask/units/lat;hide/values/anch/x;y/ln;wd/freq|text_info|title
LATLON     Line color/dash/width/freq/inc/label/format
*TITLE     Title color/line/title
CLEAR      Clear screen flag
PANEL      Panel loc/color/dash/width/regn
*DEVICE    Device|name|x size;y size|color type
PROJ       Map projection/angles/margins|drop flag
FILTER     Filter data factor
TEXT       Size/fnt/width/brdr/N-rot/just/hw flg
LUTFIL     Enhancement lookup table filename
STNPLT     Txtc/txt attr|marker attr|stnfil#col
CLRBAR     Color/ornt/anch/x;y/ln;wd/freq|text_info
LSTPRM     Filtered parm|x;y|TEXT info

**PROGRAM DESCRIPTION**

SFMAP plots data at station locations on a map. Any parameter that can be computed from the parameters in the data set can be displayed. Conditions can be specified for the parameters. The conditions are documented in the SFPARM documentation. Data may be plotted in any valid GEMPAK projection and may be overlaid on images.

A list of times may be given in DATTIM allowing animation of surface plots.

The order of the input parameters determines their location on the plot. Parameters are separated by semicolons. A position may be skipped by entering two consecutive semicolons or entering the name SPAC or BLNK. A parameter will be plotted centered at the station if it is the first parameter in the list, for example, if SFPARM = SKYC, the sky cover symbol will be plotted centered on the station location. If no parameter is to be displayed centered on the station location,
a semicolon must appear before the first parameter listed. SPAC or BLNK may also be entered. The following chart shows the location on the model of each position.

```
  8
 2 10 4
 3  1  5
 6 11  7
 9
```

Note that wind symbols and markers are always plotted at the center of the station model.

If FILTER is set to YES, the stations will be filtered so that overlapping stations will not be plotted. FILTER may also be entered as a number greater than or equal to zero. FILTER = NO has the same effect as FILTER = 0. FILTER = 1 has the same effect as FILTER = YES. Values less than 1 allow more crowding of stations, values exceeding 1 less crowding. If a position is skipped using two semicolons or if the parameter is BLNK, the filter will not allocate the space. The parameter SPAC may be used to reserve the space with the filter option. Then later plots will plot the same stations after filtering, provided that the same parameter locations are specified.

If certain stations are not to be removed by the filter, these stations are listed first following an @. The area over which filtering is to occur is specified after a slash. For example,

```
AREA   = @bwi;iad;dca/md
FILTER = YES
```

will display a filtered array of stations over the area corresponding to MD, but BWI, IAD and DCA will be shown regardless of the filtering.

Weather symbols can also be plotted. The size and width of the symbols can be specified by appending the numbers to the parameter name using a colon as a separator. For example, WSYM:2:5 will plot weather symbols with size of 2. and line width of 5.

Other symbols can be specified in a similar way. The names for the pressure tendency, sky cover, cloud type, weather and wind symbols and how their characteristics are set are given in the SFPARM documentation.

Parameters can be color-coded based on their own value or on the value of any other computable parameter. Refer to the COLORS documentation for details. If one or more parameters are color-coded, a color bar will be displayed for the first color-coded parameter.

EXAMPLES

1. Display the visible satellite image from 18Z and overlay the surface data for the area covered by the image. Plot a standard station model for each location in the data set.
The surface data to plot include: 1) sky cover symbol; 2) temperature in Fahrenheit; 3) weather symbol; 4) coded mean sea level pressure; 5) pressure tendency with symbol; 6) dewpoint in Fahrenheit; 6) station ID; 7) visibility; and 8) wind barbs in knots. The data are plotted using the specified color list.

AREA      = us
GAREA     = dset
SATFIL    = $GEMDATA/VIS_910819_1801
RADFIL    =
IMCBAR    = 1/V/LL/0;.05/.90
SFPARM    =
             skyc:.75;tmpf;wsym:.75;smsl;ptnd;dwpf;stid;;vsby*10;brbk:1:2;mark:2
DATTIM    = 910819/1800
SFFILE    = $GEMDATA/hrcbob.sfc
COLORS    = 26;2;7;25;20;22;18;24;6
MAP       = 1
LATLON    = 2/10/1/1/5;5
TITLE     = 1
CLEAR     = yes
PANEL     = 0
DEVICE    = xw
PROJ      = sat
FILTER    = 1
TEXT      = 1/22//hw
LUTFIL    =
STNPLT    =
CLRBAR    =
LSTPRM    =

2. Using the above specifications, change the area to New Jersey. The satellite image will be subset and replotted with the data for that area. Change the filter factor to allow more stations to be plotted.

AREA      = nj
GAREA     = nj
SATFIL    = $GEMDATA/VIS_910819_1801
RADFIL    =
IMCBAR    = 1/V/LL/0;.05/.90
SFPARM    =
             skyc:.75;tmpf;wsym:.75;smsl;ptnd;dwpf;stid;;vsby*10;brbk:1:2;mark:4
DATTIM    = 910819/1800
SFFILE    = $GEMDATA/hrcbob.sfc
COLORS    = 26;2;7;25;20;22;18;24;6
MAP       = 1
LATLON    = 2/10/1/1/5;5
TITLE     = 1
CLEAR     = yes
PANEL     = 0
DEVICE    = xw
PROJ      = sat
FILTER    = .45
TEXT      = 1/22//hw
LUTFIL    =
STNPLT    =
CLRBAR    =
3. Using the previous specifications, vary the color of the weather symbols by color coding them according to their precipitation type.

To make them more discernible, omit using the satellite image and change the map projection.

```
AREA = nj-
GAREA = nj
SATFIL =
RADFIL =
IMCBAR =
SFPARM =

skyc:.75;tmpf;wsym:.75;smsl;ptnd;dwpf;stid;;vsby*10;brbk:1:2;mark:4
DATTIM = 910819/1800
SFFILE = $GEMDATA/hrcbob.sfc
COLORS = 26;2;(19-90-10/17;6;8;17;3;3;1;22;2);
25;20;22;18;24;6
MAP = 1
LATLON = 2/10/1/1/5;5
TITLE = 1
CLEAR = yes
PANEL = 0
DEVICE = xw
PROJ = mer
FILTER = .45
TEXT = 1/22//hw
LUTFIL =
STNPLT =
CLABAR =
LSTPRM =
```

ERROR MESSAGES

-1 ! Fatal error initializing TAE.
-2 ! Fatal error reading TAE parameters.
-3 ! Fatal error initializing GEMPLT.
-4 ! Parameter !AS is not calculable.
-5 ! Winds are not calculable.