STITLE, A PACKAGE TO CREATE SCROLLED MOVIE TITLES

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1.0 INTRODUCTION

The package STITLE is used to create movie titles. The titles can be scrolled, faded in, and/or faded out. Foreground and background colors can be specified.

1.1 Usage

The package STITLE has six user entry points, as follows: FTITLE, STITLE, SLGETI, SLGETR, SLSETI, and SLSETR. There is also a routine called SLUBKG that is called by STITLE and exists solely to be replaced by the user.

FTITLE stands for “fixed titles” and is used when the following conditions are met:

- Each group of text lines is to fit on one frame (no scrolling).
- Vertical spacing of text lines is to be done automatically.
- Text lines are to be centered horizontally.
- There are to be no more than 80 characters per text line (including PLOTCHAR “function codes”).
- In production mode, blank frames are to be generated before and after each group of title frames.
- No more than 120 text lines are to be displayed on a single frame.

STITLE stands for “scrolled titles” and is used when the above conditions are not met.

SLSETI and **SLSETR** are used to set the values of “internal parameters” whose values affect the behavior of FTITLE and/or STITLE.

SLGETI and **SLGETR** are used to retrieve the current values of internal parameters.

SLUBKG is not to be called by the user. It is called by STITLE just before and just after the drawing of titles on each frame. The default version of the routine does nothing. A user version may be supplied to add desired graphics to the frame.

Each of the routines of STITLE is described in detail in the section “ROUTINES”.

Internal parameters are discussed in detail in the section “INTERNAL PARAMETERS”.

Error messages are described in the section “ERROR MESSAGES”.

Note: Since STITLE uses the GFLASH package to reproduce pictures when possible, and since a setting for color index 0 is saved in GFLASH buffers, you may get a warning message from some CGM interpreters that color index 0 has been set after plotting has begun in a given picture. This warning message can safely be ignored.

1.2 Miscellaneous Information

1.2.1 Portability

STITLE conforms to the FORTRAN-77 and GKS standards.

1.2.2 Required Library Packages

STITLE uses the NCAR Graphics packages COLCONV, GFLASH, and PLOTCHAR.

1.2.3 History

STITLE replaced the previous routines AUTOTITLE and SCROLL at NCAR.

In April, 1980, the package was rewritten, changed to use the new PWRITX instead of the old PWRX, and made portable.

In June, 1989, the package was converted to be compatible with the FORTRAN-77 and GKS standards, and was made to use PLOTCHAR and GFLASH. User entries SLGETI, SLGETR, SLSETI, and SLSETR were added. Fade-in and fade-out were added.

In January, 1993, the package was changed to use clipping built into PLOTCHAR. An error in the handling of continuation lines was corrected. The names of all internal entities were changed to start with ‘SL’. Parameter interface routines were made consistent with those in other packages. STITLE was changed to accept “cards” of arbitrary length and FTITLE was changed to accept 80-character text lines.

2.0 ROUTINES

2.1 FTITLE (MOVIE)

The routine FTITLE is used for unscrolled movie titles. It reads, from standard input, the information necessary to define the desired title frames, and then calls STITLE to create those frames.

2.1.1 Usage

To call the subroutine FTITLE, use the following FORTRAN statement:

```
CALL FTITLE (MOVIE)
```

2.1.2 Arguments

MOVIE (an input expression of type INTEGER) is a switch indicating whether this is a “real” run or a “practice” run:

0 means “real run”.

1 means “practice run”.

During real runs, each title frame is repeated as many times as necessary to display it for a user-specified time period (at 24 frames per second). Blank frames are placed before the first title frame, between consecutive title frames, and after the last title frame. (Blank frames are to allow for splicing; the internal parameters 'TM1' and 'TM2' specify how many blank frames are used in each position.) If the user has turned on fade-in (by setting the internal parameter 'FIN' non-zero), and/or fade-out (by setting the internal parameter 'FOU' non-zero), the required fade-in and fade-out frames will be generated, as well.

During practice runs, each title frame will occur from one to three times (once for fade-in, once for the stationary holding time, and once for fade-out); each of these frames will have a legend indicating how many seconds the frame represents in a real run. Each sequence of blank frames will be replaced by a single frame with a message indicating how many seconds worth of blank frames it represents.

2.1.3 Input Data Read By FTITLE

FTITLE reads data from the unit specified by the internal parameter 'ICU', which has the default value 5, to specify standard input; this parameter can be given a different value to specify that another unit should be read instead.

The input data are read in groups. Each group represents one title frame. There can be any number of groups. FTITLE keeps processing groups until a group with NCARD=0 is read. A group consists of the following:

- A header line from which variables NCARD, TIME, and SIZE are read, using the FORTRAN format “(I5,2F5.1)”.

  NCARD is the number of text lines that follow. If NCARD=0, FTITLE returns to the calling routine.

  TIME is the time, in seconds, that the title frame should be displayed (not including fade-in and fade-out, if any).

  SIZE is the desired character size, given as a multiplier of a default height specified by the value of the internal parameter 'PSZ', the default value of which is 21 (out of 1024). Values of SIZE from .75 to 2.5 are recommended.

- Text lines, each containing one line of the title frame. PLOTCHAR function codes may be used as specified in the documentation for that package. Characters should not appear beyond column 80.

2.1.4 Internal Parameters That Affect FTITLE

The internal parameters 'ALN', 'BGB', 'BGG', 'BGR', 'FGB', FGG', 'FGR', 'FIN', 'FOU', 'GSZ', 'ICO', 'ICU', 'LOG', 'LX1', 'LX2', 'LY1', 'LY2', 'MAP', 'ORV', 'PSZ', 'SBK', 'SFG', 'TM1', 'TM2', and 'WID' all affect the behavior of FTITLE in one way or another. Some of these have been mentioned above; all are described in the section “INTERNAL PARAMETERS”.

2.2 STITLE (CARDS,NCARDS,NYST,NYFIN, . . .)

(The remaining arguments are **TST**, **TMV**, **TFIN**, and **MOVIE**.)

This routine creates scrolled movie titles. It receives all input through the argument list.

2.2.1 Usage

To call the subroutine STITLE, use the FORTRAN statement

```
CALL STITLE (CARDS,NCARDS,NYST,NYFIN,TST,TMV,TFIN,MOVIE)
```

2.2.2 Arguments

CARDS (an input array, dimensioned NCARDS, of type CHARACTER*n, where “n” is greater than or equal to 21) is the “card input buffer”. This array must be filled, prior to calling STITLE, either by internal manipulations or by reading n-character “cards”. Each element of the array CARDS represents one line on the scroll (or, sometimes, a continuation of a previous line) and contains the following:

- **Columns 1-5**: MX, the X coordinate of the line of text on the scroll. This is normally a value between 1 and 1024, inclusive. Exactly how the line of text is positioned relative to the specified X coordinate depends on the value of ICNTR (in columns 11-15).

  If the value -9999 is used for MX, it indicates a continuation line: characters from columns 21 through “n” are just appended to the characters from the previous card to form the line of text. Any number of continuation cards may be used, but the total number of characters in a line of text must not be greater than 512.

  Trailing blanks are omitted from each card, including those that are followed by a continuation card; thus, if there are to be blanks between the characters from one card and the characters from a continuation card, those blanks must be placed in columns 21 and following of the continuation card.

  On a continuation card, columns 6-20 are ignored.

- **Columns 6-10**: MY, the Y coordinate of the line of text on the scroll. MY may range from -9999 to 99999.

- **Columns 11-15**: ICNTR, the centering option:

  0 means “start the text at MX”.

  1 means “center the text about MX”.

  2 means “end the text at MX”.

- **Columns 16-20**: SIZE, the desired size of the characters to be used in writing the line. SIZE is given as a multiplier of a default height specified by the value of the internal parameter 'PSZ', the default value of which is 21 (out of 1024). Values of SIZE from .75 to 2.5 are recommended.

- **Columns 21-n**: Text for this line (or for continuation of a line when MX = -9999).

NCARDS (an input expression of type INTEGER) is the dimension of the array CARDS (i.e., the number of card images in it).

NYST (an input expression of type INTEGER) is the Y coordinate that will be at the center of the screen when the text is first displayed.

NYFIN (an input expression of type INTEGER) is the Y coordinate that will be at the center of the screen when the text is last displayed.

TST (an input expression of type REAL) is the time in seconds that the scroll will be stationary at NYST. One second is recommended.

TMV (an input expression of type REAL) is the time to move the scroll from NYST to NYFIN. This should be the time required to read the text aloud at slow to normal speed.

TFIN (an input expression of type REAL) is the time that the scroll will be stationary at NYFIN. One second is recommended.

MOVIE (an input expression of type INTEGER) is a switch to indicate whether this is a “real” run or a “practice” run.

0 means “real run”.

1 means “practice run”.

During real runs, frames are created for the fade-in sequence (if the user has turned on fade-in by setting the internal parameter 'FIN' non-zero), the stationary sequence at the start (if TST is non-zero), the scrolling time (if TMV is non-zero), the stationary sequence at the end (if TFIN is non-zero), and the fade-out sequence (if the user has turned on fade-out by setting the internal parameter 'FOU' non-zero).

During practice runs, only selected frames are created: a frame for the fade-in sequence (if fade-in is turned on), a frame for the stationary time at the start, a set of frames representing the scrolling sequence, a frame for the stationary time at the end, and a frame for the fade-out sequence (if fade-out is turned on). Each has a legend indicating either for how many seconds the frame will be shown or, if it is part of a scroll sequence, how many seconds into the scroll time it occurs; during real runs, these legends are omitted, of course.

Fade-in and fade-out are also affected by the values of the internal parameters 'SBK', which can be set in such a way as to allow or to suppress fade-in and fade-out of the background color, and 'SFG', which serves the same function for the foreground color.

2.2.3 No Input Data Read by STITLE

STITLE receives all input through its argument list; unlike FTITLE, it doesn't read anything from an input unit.

2.2.4 Internal Parameters That Affect STITLE

The internal parameters 'ALN', 'BGB', 'BGG', 'BGR', 'FGB', FGG', 'FGR', 'FIN', 'FOU', 'LOG', 'LX1', 'LX2', 'LY1', 'LY2', 'MAP', 'NXE', 'NXS', 'ORV', 'PSZ', 'SBK', 'SFG', and 'WID' affect the behavior of STITLE in one way or another. Some of these have been mentioned above; the others are described in the section "INTERNAL PARAMETERS".

2.2.5 Algorithm

STITLE in effect moves the specified text up through the screen window, outputting the frames required to generate a movie sequence of the duration specified by the user.

At each frame STITLE skips plotting lines of text that are completely outside of the screen window. Lines of text that are partially in the window are clipped by PLOTCHAR.

2.3 SLGETx (PNAM,xVAL)

These routines are used to get the current values of internal parameters that affect the behavior of STITLE and FTITLE. The "x" stands for either an "I" or an "R". See the section "INTERNAL PARAMETERS" for a complete list of all the internal parameters.

2.3.1 Usage

Use one of the following FORTRAN statements:

```
CALL SLGETI (PNAM,IVAL)
CALL SLGETR (PNAM,RVAL)
```

2.3.2 Arguments

PNAM (an input expression of type CHARACTER) specifies the name of the parameter whose value is to be retrieved. Only the first three characters of the string are examined.

IVAL (an output variable of type INTEGER) is the current value of the internal parameter. If the internal parameter is of type REAL, INT(real value) will be returned.

RVAL (an output variable of type REAL) is the value of the internal parameter. If the internal parameter is of type INTEGER, REAL(integer value) will be returned.

2.4 SLSETx (PNAM,xVAL)

These routines are used to set the values of internal parameters that affect the behavior of STITLE and FTITLE. The “x” stands for either an “I” or an “R”. See the section “INTERNAL PARAMETERS” for a complete list of all the internal parameters.

2.4.1 Usage

Use one of the following FORTRAN statements:

```
CALL SLSETI (PNAM,IVAL)
CALL SLSETR (PNAM,RVAL)
```

2.4.2 Arguments

PNAM (an input expression of type CHARACTER) specifies the name of the parameter to be set. Only the first three characters of the string are examined.

IVAL (an input expression of type INTEGER) is the desired value of the internal parameter. If the internal parameter is of type REAL, it will be given the value REAL(IVAL).

RVAL (an input expression of type REAL) is the desired value of the internal parameter. If the internal parameter is of type INTEGER, it will be given the value INT(RVAL).

2.5 SLUBKG (IPOC)

2.5.1 Usage

This routine is not to be called by the user. It is called by STITLE as title frames are being produced. The default version of the routine does nothing but RETURN; a user version can be supplied to draw a background on the title frame. In such a user-supplied version, care should be taken not to alter the state of GKS or SPPS in ways that will interfere in an undesirable way with the drawing of the titles. The details of using this routine have not been worked out yet; eventually, there will be an example showing how to use the feature.

2.5.2 Arguments

IPOC (an input expression of type INTEGER) indicates the position of the call to SLUBKG in the routine STITLE, as detailed in the following table:

Value of IPOC	Position of call to SLUBKG
-1	Just before drawing titles on a “fade-in” frame.
+1	Just after drawing titles on a “fade-in” frame.
-2	Just before drawing titles on a “start” frame.
+2	Just after drawing titles on a “start” frame.
-3	Just before drawing titles on a “move” frame.

Value of IPOC	Position of call to SLUBKG
+3	Just after drawing titles on a “move” frame.
-4	Just before drawing titles on an “end” frame.
+4	Just after drawing titles on an “end” frame.
-5	Just before drawing titles on a “fade-out” frame.
+5	Just after drawing titles on a “fade-out” frame.

3.0 INTERNAL PARAMETERS

The table below describes all of the internal parameters of STITLE; for each, it gives the name of the parameter, its default value, and its function in the package.

Name	Default value	Function
'ALN'	0	Flag to control whether alignment frames with dots in the corners are produced in non-test mode. 'ALN'=0 means “suppress them”, and 'ALN'=1 means “produce them”.
'BGB'	Device default.	A real value, in the range 0. to 1., to be used for the blue component of the background color.
'BGG'	Device default.	A real value, in the range 0. to 1., to be used for the green component of the background color.
'BGR'	Device default.	A real value, in the range 0. to 1., to be used for the red component of the background color.
'FGB'	Device default.	A real value, in the range 0. to 1., to be used for the blue component of the foreground color (in which the titles are drawn). The title color can also be set by calling the GKS subroutine GSCR to define color index 1; this must be done prior to calling any STITLE routine and the color thus specified will be used for all titles. The title color can also be set by calling PCSETI to change the values of internal parameters of PLOTCHAR that control character color; this can be done prior to the STITLE call that writes a given title.
'FGG'	Device default.	A real value, in the range 0. to 1., to be used for the green component of the foreground color. The characters are drawn in the foreground color. See also the description of 'FGB', above.
'FGR'	Device default.	A real value, in the range 0. to 1., to be used for the red component of the foreground color. The characters are drawn in the foreground color. See also the description of 'FGB', above.
'FIN'	0.	Number of seconds to fade in titles. The background color and foreground color are faded in independently. Each color is faded in from black to its current color by varying the value parameter in an HSV representation of the color in a linear manner over the time period specified.
'FOU'	0.	Number of seconds to fade out titles. The background color and foreground color are faded out independently. Each color is faded out from its current color to black by varying the value parameter in an HSV representation of the color in a linear manner over the time period specified.

Name	Default value	Function
'GSZ'	40.	Value for interline spacing, defined in terms of a 1024x1024 grid. Used only by FTITLE.
'ICO'	1	Centering option. Set to 0 to get left edges lined up at X-coordinate 64, and to 2 to get right edges lined up at X-coordinate 960. Set to 1 for centered text. Used only by FTITLE.
'ICU'	5	Unit number for reading input. Used only by FTITLE.
'INC'	300	Vertical spacing between practice frames. Used only by STITLE.
'LOG'	4	FORTRAN logical unit number for opening WISS (Workstation-Independent Segment Storage).
'LX1'	0	Integer, in the range 0 to 32767, specifying the X coordinate of the lower left corner of the viewport.
'LX2'	32767	Integer, in the range 0 to 32767, specifying the X coordinate of the upper right corner of the viewport.
'LY1'	0	Integer, in the range 0 to 32767, specifying the Y coordinate of the lower left corner of the viewport.
'LY2'	32767	Integer, in the range 0 to 32767, specifying the Y coordinate of the upper right corner of the viewport.
'MAP'	100	If greater than zero, the value to which PLOTCHAR's internal parameter 'MA' is to be set; otherwise, the user will be assumed to have set it. The default values of 'MAP' and 'ORV' are such as to create scrolled titles in the normal way; other values may be used to create titles that scroll upwards on the surface of the globe or that scroll off into space (a la Star Wars); the appropriate transformations need to be embedded in a user-written version of the PLOTCHAR routine PCMPXY. (This is still rather new; eventually, there will be an example showing how to do this.)
'NXE'	512	Analogous to the STITLE argument NYFIN, to allow for limited scrolling in the X direction. 'NXE' must be within the current STITLE window.
'NXS'	512	Analogous to the STITLE argument NYST, to allow for limited scrolling in the X direction. 'NXS' must be within the current STITLE window.
'ORV'	1.E12	If non-zero, the value to which PLOTCHAR's internal parameter 'OR' is to be set; otherwise, the user will be assumed to have set it. See the discussion of the parameter 'MAP', above.
'PSZ'	21.	Default character height on a 1024 by 1024 grid.
'SBK'	0	Suppresses fade in/out of the background color when a fade in/out time has been specified. If 'SBK'=0, then the fade in/out will be honored; otherwise, the background color will appear at full intensity during a fade in/out.
'SFG'	0	Suppresses fade in/out of the foreground color when a fade in/out time has been specified. If 'SFG'=0, then the fade in/out will be honored; otherwise, the foreground color will appear at full intensity during a fade in/out.
'TM1'	1.	Number of seconds worth of blank frames generated before any title frames (at 24 frames/second.) Used only by FTITLE.

Name	Default value	Function
'TM2'	.5	Number of seconds worth of blank frames between sets of title frames, and after the last set of title frames. Used only by FTITLE.
'WID'	9	Workstation identifier for WISS (Workstation-Independent Segment Storage); this is used internally in the calls to GFLASx.

4.0 ERROR MESSAGES

The error messages described can be written to the output unit by routines in the package STITLE. Unless otherwise indicated, these errors are fatal and cause the user's program to terminate execution.

```
FTITLE -- NUMBER OF INPUT CARDS EXCEEDS 120
```

The meaning should be obvious. Correct the input.

```
SLBKGD - Error flag returned by GQFAIS - n
SLBKGD - Error flag returned by GQFACI - n
```

These probably mean that GKS is not in the correct state (e.g., it hasn't been opened).

```
SLGETI OR SLGETR -- INVALID KEYWORD = xxx, ZERO VALUE RETURNED
```

SLGETI or SLGETR has been called with an unrecognized parameter name. A zero value is returned. Execution continues.

```
SLINIT -- No active workstations.
```

SLINIT is an internal routine that is called by STITLE to initialize things. It has found that there are no active workstations. This probably means that GKS has not been properly initialized.

```
SLSETI OR SLSETR -- INVALID KEYWORD = xxx, NO ACTION TAKEN
```

SLSETI or SLSETR has been called with an unrecognized parameter name. No action is taken. Execution continues.

5.0 EXAMPLES

The code for the NCAR Graphics example named "tstitl" can be acquired and run with the command

```
ncargex tstitl
```

The resulting metafile will be called "tstitl.ncgm". This example demonstrates minimal functioning of STITLE. The command

```
ncargex -n tstitl
```

can be used to get the code for the example (in a file called “tstitl.f”), but not to run it. After modifying the code, one can use the commands

```
ncargf77 tstitl.f
a.out
ctrn gmeta
```

to compile and execute the code and view the resulting metafile.