

LOFTSMAN Version 4 and later  
Version history

Version 4.0.001  
1/9/98

Added ability to restore default start and stop points by blanking dialog fields. Limited range of wing meshes to physical span. Corrected failure to load body files when a wing file was loaded but no body files were. Added updating of version number in copyright banner. Corrected sign of datum shifts in wing dimension editing. Added editing of curved panels to wing dimension editing. Increased view area margins to prevent clipping of images by status bar and toolbar, and generalized view area clipping implementation for all resolutions. Provided temporary increment size on body intersections to avoid unnecessary slowdown. Changed threshold of increment size warning for contours. Added local control of spanwise start and stop locations to the rib dialog. Corrected misbehavior of spar routine with start and stop limits. Added start, stop, and step to spar dialog. Restored functionality to "undo" in body lines editing window.

Version 4.0.002  
1/14/98

Corrected behavior of scaling reset in body line editing routine. Added flap nose offsets calculation. Eliminated crazed reaction to occasional node count mismatches in body mesh calculations. Changed error message for "add corner" on non-straight segments. Corrected error in handling of redraw of K Factor lines. Corrected confusion between names and pseudonyms of "keep" files in wing and body bounded regions. Removed array indexing problem that caused occasional failures in body bounded region meshing. Fixed crash after editing curvatures of certain mold- or control lines. Fixed various other problems with body line editing. Put fence at edge of cliff in wing line editing routine.

Version 4.0.003  
2/1/98

Fixed wing intersection point selection when limited to upper or lower surface and with fixed spacing. Corrected problems with mirroring of wing panels and with meshing of mirrored wing panels. Provided check of match for current wing/flap files, and added wing name to .FG file. Added validity check to body scaling routines. Eliminated the .MOD file extension from the flap profile editing routine and added on-screen confirmation of saves. Made the ordinal number in left column begin with 1 rather than 0 in newly-written .SD files (this will not affect the compatibility of earlier files). Added more legal jargon to copyright screen. Prevented wing bounded region dialog from showing names of discarded temporary files after first use. Made flap definition and saving (but not kinematics) routines functional. Corrected failure to interpolate asterisked axis values in .WI file. Corrected failure to save lines as 2D DXF files. Added ability to erase groups of files associated with a flap design. Corrected failure to save wing data after datum shifting or scaling. Fixed problem with dragging tangent at tail of body.

Version 4.0.004  
2/12/98

Corrected failure to scale screen properly for "normal sections" display with certain combinations of A-type bodies. Corrected failure of bounded-region routine for wings to mesh the starboard side of a vertical fin projecting downward from a body. Fixed failure of wing meshing to reverse section point order in some cases. Revised airfoil modification procedure for better control of source and destination file names and drives. Fixed meshing of boattail bodies. Restored forced nodes functionality for paneled normals. Made saves work for paneled normals. Made current wing the default wing for wing root meshes. Added wait cursor and escape key check to section saves and transition meshes. Corrected failure of transition meshes to handle more than 10 columns.

Version 4.0.005  
2/25/98

Corrected failure in reading spliced body files. Corrected problems with display of body sections in rows, and extended this function to screen display as well as saving and plotting. Altered procedure for finding outer hull of bodies to better account for A-type sections. Fixed horrible bug introduced in previous version, which prevented saving more than one segment at a time; this had disabled patches, rows, etc.

Version 4.0.006  
3/18/98

Fixed problems with saving patches of below-centerline vertical panels. Added "reverse point order" option to wing bounded regions. Enlarged edit fields in K Factor dialog to allow larger dimensions without truncating decimal places. Fixed failure of "Range reset" when no wing file was loaded. Made radio buttons and check boxes in wing root mesh dialog retain their settings from one invocation of the procedure to the next. Cleared up several problems in the flap definition procedure. Added direct editing of some flap and morph parameters and implemented option of 5-digit airfoil equations. Corrected failure of edit routines to remember file name given in Save As dialog. Corrected failure of edit routines to add or delete segments properly in BL moldlines. Ensured that saved moldlines end up in the executable's home directory. Swapped the locations of the Rotate and Drag handles on the Morph and Ghost in the flap definition procedure.

Version 4.0.007  
4/9/98

Added build (.BLD) files. Provided for edit routines to remember the last moldline worked on so long as the current primary body doesn't change. Implemented "Align corner" command in edit routine. Fixed bug that caused crash if the end ribs for a wing bounded region mesh had other than 30 chordwise stations. Fixed bug that prevented recognition of "kept" coordinate lists for wing ribs.

Version 4.0.008  
5/1/98

Made file selection dialog for inserting a filed segment or a segment template in a moldline in the body editing routine come up immediately when there is only one segment in the moldline. Corrected failure of existing segment and frame to reappear when a template had been placed on the screen. Fixed failure when body contours were requested on an unscaled screen. Corrected mixup between FS and BL values in fuel tank centroid display. Added code to deflected flap mesh procedure to guarantee closure of trailing edges. Corrected memory allocation error in finding zero-degree obliques when moldlines include filed segments. Suppressed error message in routine finding intersection of curves with oblique lines in order to avoid needless stops in contour calculation. Moved expiration date to 7/31/98.

Version 4.0.009  
6/2/98

Made wing file name disappear when no name is entered in the file name list box. Changed procedure for starting a new body so that the .LFT file type and the nose and tail stations are selected before starting. Length and diameter defaults now are appropriate to the units in use. Revised body bounded region procedure. Corrected break rib definition routine to eliminate small errors in leading edge position in some breaks. Revised wing root mesh dialog box and added ability to "keep" fuselage sections at the leading edge or trailing edge of the wing root while saving a wing root mesh. Flap definition and kinematics routines are largely but not completely implemented.

Version 4.0.010  
6/5/98

Corrected confusion between point and section order in defining certain ribs. Made it possible to reverse rib order for multiple ribs by listing the outboard end first. Provided press-persistence in toolbar buttons in the edit window and ensured that all editing commands are mutually exclusive. Provided press-persistence in some buttons on the flap editing toolbar. Introduced new .SD file format; old format is still supported transparently. Shifted expiration to 8/31/98.

Version 4.0.011  
6/23/98

Fixed bug that prevented recognition of the WL of the anchor point for default-canted ribs in vertical panels. Made it possible to obtain a rib with default (ie "panel rib angle") cants when the anchor point lies on the plane of a break rib. Corrected bug that caused program to crash when no wing data file was loaded, and an intersection of a wing with a body was requested by typing the wing name into the dialog box. Added K-factor validity checking to cross-section calculation routine, and modified B-body cross-section perimeter routine to handle K factors very close to zero. Improved positioning of grid axis labels. Converted all .SD file read and write operations in flap design functions to new format. Corrected error that caused output files that should have been saved in Loftzman's home directory to be saved in the current default directory instead. Corrected failure of wing root meshing to follow transition zone section spacing instructions from the dialog box. Tentatively changed procedure for combining bodies to prevent misidentifications of the outer hull in certain circumstances. Added

ability in the K Factor routine to get Y for a given X once a K factor has been found. Added code in flap travel routines for adding, replacing, and deleting roller paths. Shifted list of all rollers from outboard to inboard actuator plane in .FT file. Added BL tolerance parameter to flap design parameters dialog. Corrected error in deflected-flap meshing routine that sometimes caused errors in nodes stations near trailing edge. Implemented saving and reading of flap travel and roller track files.

Version 4.0.012  
6/23/98

Made distance-measuring procedure match the description in the documentation. Made angle-measuring routine work properly. Added "user-defined" option to normal section routine. Corrected errors in routine for converting a list of coordinates into an .SD file.

Version 4.0.013  
7/5/98

Added Y and Z coordinates to area/volume centroids. Removed low-level local creations of device contexts. Added screen printing. Added BL, slot coordinates, and actuator extension panes to flap window status line. Fixed failure of file selection button to work on first use when no files are loaded. Corrected failure of intersections to print or to redraw after zooms. Changed break selection in flap editing to "combo-box" format. Added "Locate" routine to flap window.

Version 4.0.014  
7/12/98

Corrected error in conversion of metric units for span and areas in wing geometry output. Added flap information to .BLD file reader. Fixed "Save as A-type" command in edit window. Added code to do diaphragm meshes of filed sections. Corrected failure of paneled normals with forced nodes to recycle, ie to save, print, etc. Overhauled wing root mesh procedure to provide support for terminating transition segments with filed sections and for keeping leading and trailing edge sections for subsequent use.

Version 4.0.015  
8/3/98

Corrected problem with patch definition on port side of oblique wing root meshes. Changed "starboard" and "port" to mutually exclusive choices in wing root mesh setup dialog. Made rotation rate of planelet sensitive to screen resolution. Removed prohibition on finding the intersection of two bodies when the intersecting body is also one element of a currently loaded compound body. Began adding support for IGES save file format. Fixed faulty definitions of fore and aft transition meshes with cusped bodies and wings close to the top or bottom of the body. Added "Fore only" option to exponential modification of airfoils. Corrected failure of "Body of revolution" airfoil modification option to use proper "aft end" values for finite trailing edges. Corrected failure of dimensionalized airfoil sections to save using DXF format. Implemented plotting. Revised plotting dialog to

eliminate the option of plotting to a file (which some Windows plotter/printer drivers still provide). Added plotting area dimensions to LM.INI. Fixed bug that caused reversal of inboard section point order on some wing bounded region meshes. Fixed occasional insistence of starboard bounded region wing meshes on turning up on the port side. Corrected failure of file import to work when tabs appeared in lieu of spaces between numbers. Corrected failure of underlayer to display in flap editing window. Added "no triangles" option to diaphragm mesh dialog for internal flow cases. Corrected error in procedure for deleting a roller track. Added hardware copy protection code. Extended expiration to 9/30/98. Implemented "skeleton" format for wing patch saves. Added dimensional correction factors to plot dialog and to LM.INI.

Version 4.1.0 (first non-Beta release)  
9/1/98

Made "Filed section (.SD)" command file selection dialog use .SD directory by default. Corrected crash when plotting flap roller tracks without having displayed a mouse-controlled moveable track. Fixed some other plotting problems. Implemented control of chordwise spacing in wing meshes. Eliminated afterimages from zooming and slewing operations. Added automatic trailing edge closure to skeleton format wing patches. Added ability to change incidence to body line editing routine. Fixed failure to save all elements of a compound body after editing. Added menu selection to reverse lines in a file. Fixed mismatch of some wing bounded region root ribs with corresponding fuselage wing root meshes. Fixed intermittent problem with transition meshes. Added code to suppress patch-generation options in basic version. Removed expiration date. Added file name and compilation code to main window header.

Version 4.1.1  
9/26/98

Prevented profile-editing routine from adding a path to the destination file name when one was already there. Added printer detach code to ESC when used to terminate a series of tiled plots. Collected Reverse, Rotate, Translate and Interpolate items under Misc > Lines and points. Added ability to recognize "kept" files to Reverse operation. Added line rotate and translate commands. Replaced copyright message on demo version. Repaired problems with file name and path selection for profile editing. Made the station count variable control the number of points in a dimensionalized profile in the Edit > Profile routine. Made dimensionalized profiles store in the same directory as the executable rather than in the .SD directory. Eliminated "Plotter" option from "Setup" menu. Corrected failure of profile normalization routine when upper-surface and lower-surface point counts did not match. Corrected failure of "Filed section (.SD)" item to remember the last file name used. Made uppercase P produce left-side perspective rotation. Corrected failure to obtain lip heights on reading .FT file. Ensured that newly created build files end up in the home directory. Added code to flap routine to prevent attempted execution of some actions when no flap has been initialized. Corrected failure of mouse to disengage while maneuvering flap with letter handles. Improved formatting of IBL output. Corrected failure of program to exit on "No" reply to copyright screen. Ensured that lists of saved sections are arranged in fore-to-aft order.

Version 4.1.2  
10/9/98

Ensured that wing bounded region patches end up in the home directory. Fixed failure of wing bounded regions to handle certain end rib definitions. Added message in section paneling routine to warn when increment is too large to resolve the panels. Added ability to maintain a list of wing files and rapidly switch the one currently in use. Added file selection box for entering wing, body, or WSL file names in root mesh, wing-wing intersection, wing-body intersection, body-body intersection, and some mesh setup dialogs. Changed IBL file extension to lowercase. Revised treatment of wing sections in IBL files. Added pull-down "kept items" lists and file dialogs to wing and body bounded-region, transition, and diaphragm mesh dialogs.

Version 4.1.3  
11/7/98

Repaired bug that caused distorted trailing-edge thickness when converting finite-t.e. coordinate lists to .SD file. Replaced "Save body," "Save wing," and "Save data as" commands with single "Save current" command with list selection box. Added procedure for converting temporarily "kept" files to permanently saved ones. Added ability to display .PCH files with Import command. Added screen rescaling for imported patch displays. Restored ability to create AutoCAD script files, which had been inadvertently lost when the IGES format was added. Corrected failure to display and edit MB line frames when POS is displaced from zero. Added ability to rotate body lines about Z axis. Fixed problems with profile modification for profiles with trailing edges not on the chord line. Added output file directory option. Added distinction between permanent and temporary directories for data and output files. Added ability to rotate body lines about the X axis, but it does not work well.

Version 4.1.4  
11/25/98

Added record of non-default directories to build files. Added persistent recall of current as well as default paths, plus ability to restore defaults in the directories dialog with a single button push. Added protection against zero and negative plot correction factors. Added functions for performing certain manipulations on patch files. Made Directories dialog automatically add final backslash to path names. Corrected erroneous order of roller pivot coordinate versions in .FT file. Made file entry fields in wing and body bounded region and wing root mesh dialogs display last entered file names when no kept files are present. Fixed meshing of port side fore and aft transitions in root mesh routine when filed sections are used for fore or aft limits. Corrected failure of plotting due to change in default working directory path. Corrected failure of "Script" radio button to extinguish others in the "Save" dialog. Added ability to print wing geometry listing. Corrected improper values of surface and volume centroids in the hull hydrostatics display. Added wait cursor to spar calculation. Improved accuracy of spar routine when near leading edge of wing. Fixed failure of spar routine to correctly identify certain leading and trailing edge intersections. Fixed inability to load wing files via the List/Select method. Corrected freeing of unallocated memory in dialogs using '?' button for file selection.

Version 4.1.5  
12/23/98

Corrected section numbering error in IBL saves of ribs. Added ability to create new directories in Directories dialog. Moved "Print screen" option from the Display to the Action menu. Moved Underlayer and Template menu choices to Display menu in edit routine. Added auto scrolling to directories boxes. Made blank directory field copy .LFT directory. Corrected errors in formatting of saved true views and 2D script files. Corrected failure to locate files in working directory in body transition meshing. Made initial file selection dialog come up in the .LFT directory rather than the current directory. Added check to ensure that the same file name does not appear twice in the body list. Corrected failure of wing bounded region routine to realize that temporary files are stored in the Misc directory. Corrected failure of fore transition of wing root mesh to appear when panel count below wing was specified. Added Misc directory path to kept file names. Corrected failure of zoom command in edit window to maintain isometry between X and Y axes. Added ability to rotate body by holding left mouse button and dragging the cursor. Added ability to pan with right mouse button. Implemented multiple file selection in data file selection dialog. Made the .EXE directory the default directory for all files in the demo version. Changed the default value of "row spacing" to 0.0.

Version 4.1.6  
1/26/99

Added yaw, check for intrusions, and port-side check box to wing-body wake mesh. Corrected failure of previously selected file names for inboard and outboard ribs to appear in edit fields on returns to fuselage segment mesh dialog. Added ability to display all wing files simultaneously. Deleted panning button from main screen and flap design screen toolbars. Added right-mouse-button pan to flap design window. Added ability to hide moldlines in edit window. Fixed failure of screen reset in edit window to rescale after vertical stretch. Corrected failure of edit window to mooz or zoom properly for K Factor lines. Adjusted scaling of radii graph in edit window to match stations of model. Freed cursor of clipping restraints prior to appearance of data-entry boxes in all editing operations. Added name of line being edited to title of edit window. Reversed sign of pitch angle in hydrostatic calculations to make nose-up pitch positive. Added ability to find required waterline for a given displacement and pitch angle for a given longitudinal center of buoyancy in hydrostatics routine. Changed displacement legend from "tons" to "long tons." Implemented saving of hydrostatics results. Corrected computation of metacentric height to account for pitch angle. Added time and date to saving and printing of hydrostatics output. Corrected cant angles of end ribs on meshes of curved wing panels. Added "Clear" option to directories dialog. Made "OK" rather than "Cancel" the default exit for the current files list window.

Version 4.1.7  
3/1/99

Corrected failure of wing dimension editing routine to locate section data files in the permanent .SD directory after not finding them in the

current .SD directory. Made "Import" file selection dialog default to the current "Misc" directory. Fixed failure of "Import" file selection dialog to appear after first call under some circumstances. Fixed mixups between chordwise and spanwise spacing choices in successive calls to the wing segment mesh and wing bounded region mesh dialogs. Added "SD" and "Normalized" to list of saving options. Made saving dialog automatically select "Normalized" for "SD" and "3D" for "Patch". Made wing root mesh dialog look in appropriate locations for wing or root intersection files. Made input focus go to .LFT field after clearing directory fields in the directory structure setting dialog. Fixed uninitialized point on centerline-hinged flaps when lower surface slope is steeper than upper-surface slope near the hinge line. Fixed specification of upper and lower lip stations in flap .SD files. Added "Directories" button to main toolbar. Fixed failure of "wing root mesh" to mesh port side of an engine nacelle with a pylon entering from the port. Fixed errors in generating internal-hinged flaps within swept wings when the ends of the flap did not coincide with those of the wing and the longitudinal panel rib angles were not orthogonal. Added rotation about an arbitrary axis to menu of patch editing operations. Enabled procedure for changing profile station counts to deal with normalized coordinate sets that do not extend from 0.0 to 1.0. Corrected erroneous construction of wing pathname in wing-body intersection dialog. Added routine for meshing a slotted flap together with a truncated wing section incorporating a reasonable slot geometry. Added routine for rotating 3D lines about an arbitrary axis, and added ability to define a point other than the coordinate system origin as the center for rotating 2D lines. Added 3D lines to line translation routine. Added "All" and "Primary" popup items to wing outline menu command. Corrected misbehavior of flap blend point selection routine. Added end transitions to slotted flap mesh routine, but they are not satisfactory yet.

Version 4.1.8  
3/31/99

Corrected failure of wing intersection routine to retain selected wing file name when recycling. Corrected .FG file name construction in flap definition routine. Made .FT files go to "misc" directory. Revised wing root mesh routine to permit different section point counts below the wing at leading and trailing edges and to handle wing roots that emerge above or below the fuselage. Added checking for duplicate input points to spline function and to profile editing routines. Made build file include directories even if they are the default (permanent) directories. Added routine for combining separate patch files into one file. Added col/row swap to patch editing functions to permit undoing a row/col swap. Added patch edge saving to patch editing functions. Added ability to generate a surface patch from edge point lists. Corrected crash when returning to edit window after displaying moldlines. Corrected failure to compute wing tank volume properly when spar locations were given as FS rather than fraction of chord. Made wing bounded region use default wing station count, rather than 15, as an initial chordwise panel count. Enhanced wing root meshing routine to accommodate vertical fins. Increased size of filename fields in "Reverse line" dialog and added horizontal scrolling. Made results fields in Body info>BL/WL dialog go blank when out-of-body values are entered. Added "Xing" option to line manipulations. Fixed failure of GetBl() function to search for SD files in the default directory. Added Patch > Assemble command to create ready-to-run Cmarc input files from existing patches. Made change of primary wing file reset start and stop limits if no body

is loaded. Modified cubic spline function to allow lines with duplicated points. Added Double density option to patch modification menu.

Version 4.1.9  
3/31/99

Restored functionality of "Save current" toolbar button. Fixed sporadic failures after dragging tangent at tail end of body. Fixed failure to modify aft end of left segment after dragging tangent.

Version 4.1.10  
4/23/99

Fixed failure to progress after initial flap-travel-editing dialog. Fixed failure of outboard end to properly imitate inboard end on newly-defined flaps. Made wing station points entry in wing root mesh dialog control the default value for wing points. Corrected scaling of radii display in edit window to match scaling of moldlines when zoomed, etc. Added option to create linear-interpolated grid between two lines. Eliminated automatic assumption of .SCR extension for filenames without extensions in Import routine. Corrected failure to correctly set rib cants in curved panels when the panel axis was horizontal. Prevented addition of wing geometry box display to operations history. Corrected failure of wing meshing operation to terminate completely, without history record, after user cancellation on error. Added check for invalid panel rib angles (all zeros or absolute value of angle greater than 90.0 degrees). Added "match points" spacing option to wing-body intersection dialog. Added "linear interpolation" option to procedure for forming an SD file from a set of coordinates, in order to avoid spline waviness in polygonal sections. Fixed occasional collapse of moldlines to straight lines on redraw after certain sequences of operations.

Version 4.2.0  
5/25/99

Added protection against saving unequal section point counts in patch reading routine. Added dialog for arclength spacing of airfoil points. Fixed error in creating patches with col/row reversal. Corrected failure to properly mesh zero-width body cross-section of height smaller than the increment. Improved geometry of slotted flap transition meshes. Corrected chordwise panel count in wing segment patches to properly correspond with panel, not point count. Added arclength point distribution option to slotted flap meshing routine.

Version 4.2.1  
7/10/99

Added procedure for finding flat patterns of body strips. Added 3D look to dialog box edit fields. Made strip numbers for flat patterns start with 1, not zero. Added portions of performance estimation routine. Made fuselage meshing routine retain non-default fore and aft limit settings. Made Save As dialog in body line editing come up with the proper default path. Changed certain assumptions about the increment which could cause failures of the body-body intersection routine for bodies with numerically small dimensions. Corrected failure of wing root meshing to

work with vertical fins not located on the centerline, and with zero-length fore or aft transitions. Added wing root filleting routine, including root fillet control file editing. Corrected error in reporting last point in some moldline lists when the Stop FS is set ahead of the tail. Corrected inversion of ribs in curved wing panel when the outboard end of the panel is at a lower waterline than the inboard end. Provided buttons for resetting of start and stop meshing limits after change of wing or body files.

Version 4.2.2  
8/7/99

Added offsets from nested position to roller position and pivot listings in FT file. Changed order of pivot coordinates and added coordinates for final roller position. Added date to flap travel file and changed formatting to improve readability. Fixed failure in deflected plain flap meshing routine when station count exceeded 30. Added wake option to automatic Cmarc input file assembly. Made default rib interpolation routine able to use filed point sets in place of standardized-abscissa break ribs. Enabled meshing of wing panels using non-standard SD file for chordwise spacing. Removed requirement that wing break rib files have a particular number of stations or a particular spacing. Corrected failure of wing root mesh dialog to retain names of specified sections between calls. Corrected confusions between points and panels in wing segment and bounded region setup dialogs. Added SD file point count/spacing option to root mesh procedure. Fixed unintended use of wing fore and aft stations to set start and stop limits even when bodies are present. Added <Esc> to contours routine. Added copy record to moldline data structure so that moldlines that are recorded as copies of other moldlines in the LFT file are written that way, rather than explicitly, when the file is saved. Modified editing procedures so that copied lines are modified when the lines of which they are copies are modified, but their dependency is severed when they themselves are modified. Improved the specificity of some error message in the LFT file reading routine.

Version 4.2.3  
9/15/99

Corrected meshing of zero-width or zero-height cross-sections to reflect strips spacing. Changed tabbing order in K Factor routine to allow direct jump from frame point to control point entry. Modified "flow through" root meshing procedure to allow wing meshed with different numbers of upper and lower surface points. Fixed error that caused fillet control line names to come up in "copy moldline" selection dialog while editing body lines. Corrected failure to produce canted ribs. Corrected faulty BL of end rib on wing patches using SD file coordinates. Corrected some problems with handling section calculation failures and user aborts during mesh generation. Added as-filed spacing option to wing-body intersection routine. Made "small step" warning sensitive to user choice in "show moldlines" routine. Fixed failure of "Per SD file" spacing option in wing-body intersection routine. Fixed formatting of body section data. Made wing root meshing work for stored intersection with unequal number of upper and lower points. Corrected duplication of pathname after repeated use of file selection button in several mesh setup dialogs.

Version 4.2.4  
9/24/99

Added automatic replacement for display purposes of missing SD files called for by .WI files being loaded. Corrected grievously broken wing panel meshing functions.

Version 4.3.0  
11/20/99

Made reduced scaling after MOOZ commands persist through changes in viewing angle. Added "Match both" option to wing bounded regions to provide triangulation to an ending section with a different point count and/or distribution than the other sections have. Fixed problem meshing wing slotted flap transition strips with wing panel counts less than 30. Added volumetric coefficient to hydrostatics output. Added BL and WL to setup dialog for editing a new body, and provided disabling of irrelevant items for B-type bodies. Allowed backward copying of lines while editing; but back-copied lines are not recorded in the .LFT file as copies. Added identifying labels to moldlines in cross-section frame displays for A-type bodies. Implemented "Show frames" button in normal sections dialog. Corrected failure to return a canted rib when the anchor point is in the plane of a break rib. Eliminated prop wake option for Cmarc input files. Added "misc" directory path to file selection for underlayer while editing. Added "lft" directory path when user selects a new file name to save LFT files. Deleted spaces in file-type filter for Import. Added ability to save and retrieve patch lists ("PAL" files) to input file assembly dialog. Added name of line being edited to edit window title. Added ability to define moldlines as interpolated and control lines as "straight" to edit procedure. Fixed disastrously miscoded "Delete segment" procedure in body editing. Fixed problems with aligning corners and splitting straight segments in body editing. Fixed crash when canceling out of line selection dialog in body editing. Added file name selection dialog option to output saving dialog. Added context-sensitive disabling of some options in save dialog. Corrected display scaling error after editing or viewing K-factor control line. Reduced size of default increment and step for hydrostatics. Added option of saving a body file as a bilateral A-type file to allow meshing below a heeled waterplane. Enlarged edit field for single station in wing-body intersection routine. Fixed failure of wing-body intersection routine for single station. Added canoe body aspect ratio to hydrostatics results. Made display of license agreement contingent on absence of INI file. Added About/License option to Misc menu. Fixed problem with point noses on compound bodies when meshing wing roots. Corrected error in interpreting the patch edge number selection when saving a patch edge. Added "Match both" option to body bounded regions. Added "Reconcile" option to patch editing. In wing bounded region mesh setup dialog, disabled root and tip file name input fields when "Use tip and current body root" is checked, and disabled "Starboard side of vertical panel" option when current primary wing panel is not vertical.

Version 4.3.1  
12/26/99

Forced addition of .PAL extension to patch list files. Corrected patch combining routine to handle source files containing multiple patches and to allow saving under the name of one of the input files. Added ability to combine patch files using .PAL list. Corrected failure of creation of

new body in editing procedure to heed Z dimensions in the initial definition of end points. Correct failure of wing root meshing to handle fore and aft transitions with band counts exceeding the panel count of the wing root. Added spin control to wing segment mesh dialog to allow selection of a single panel between break ribs. Corrected failure of wing-wing intersection routine to find intersections when both wings were rectangular and parallel to the Y axis. Made file import dialog retain memory of the last file type called. Removed spaces from file selection dialog filters. Corrected failure to properly panel certain sections with non-monotonic contours. Corrected occasional failure of cursor to reach acceptance dialog after corner alignment in editing. Eliminated display of some undesired lines when using "Hide lines" in editing. Fixed failure of ghost to respond properly to trailing edge rotation in flap editing. Added "Accept?" query after setting blend points in flap definition.

Version 4.3.2  
1/31/00

Corrected failure to display curved wing panels when any of the break rib files had a non-standard point count. Added "mark points" and axes to profile display. Deleted space before label in patch headers. Prevented writing of IPATSYM=1 in some patches. Corrected faulty formatting of dates in printouts. Added ability to read and display all patches named in a PAL file. Corrected failure to change units when requested via dialog box. Changed some text in main menus for clarity. Added "Move end" command to body editing. Modified .SD file reading function to permit inserting @rem (remark) lines at any location. Added option of storing moldline points with radius-sensitive spacing.

Version 4.3.3  
2/26/00

Corrected mislabeling of some wing and body bounded region patches. Corrected failure to read flap SD files because of change in definition of Rdprofil(). Implemented printing, filing and retrieval of fuel tank volume data. Corrected problems in some wing bounded region options. Telescoped PCH and DXF saving of patches into one function. Added ability to find intersection of curved wing with body. Added ability to define wing root fillet for curved wing.

Version 4.3.4  
3/6/00

Corrected errors in line editing procedure for moving the aft end of a body. Corrected node mismatch between wing bounded regions and wing root meshes.

Version 4.3.5  
5/12/00

Added patch exclusion items to .IN file assembly text. Fixed orientation of "elbow" wing-wing intersection for horizontal main panels. Revised diaphragm patch saving routine to write all points explicitly. Fixed crash in file selection menu when selected file name had no extension. Enlarged data entry fields in body BL/WL dialog. Fixed failure of .PAL

files to recycle for view changes, etc. Added check for section count mismatches to patch reading routine. Changed extension for wing-body wake files from PCH to WAK. Changed station spacing in wing bounded regions to match proportional positions along chord line rather than along surface arc. Added provision to neutralize the distorting effect of wing sweep on mesh panel count adjustment strips. Removed option of turning off toolbar and status line from screen settings dialog. Supplied proper error recovery if lower lip is aft of upper in slotted flap meshing. Added hidden-line elimination to patch displays. Corrected problem in calculation of coved wing sections with arclength point distribution that produced occasional NANs near the leading edge when very large numbers of chordwise panels were used. Fixed some problems in calculation of intersections of bodies and curved wing panels. Modified cubic spline to handle cases where number of inserted points is zero. Added patch bridge procedure.

Version 4.3.6  
7/22/00

Corrected failure of wing root meshing procedure to properly handle the case of a fore or aft transition to a previously defined section. Corrected formatting of some point-list output to conform with default field and precision settings. Added CG to "Intervals" dialog. Added normalized moment of inertia and spanwise load distribution to fuel tank analysis. Removed "Append" option from Action submenu. Added hidden-line elimination to wing root mesh display. Modified and simplified wing root mesh algorithm to eliminate some errors in dealing with partial-chord wing-body intersections and to allow a wider range of partial overlaps between wings and bodies. Fixed failure of wing tank routine to calculate partial fuel, a bug introduced with the moment of inertia and spanwise loading functions. Corrected instances where IREV was given the value of 1 rather than 0 for a non-reversed patch (this had no effect on the operation of the resulting input file). Made meshing of oblique wing roots responsive to Starboard and Port commands. Added takeoff performance calculation and Breguet endurance. Corrected error in wing-body wake procedure that caused distortions in the wake rows close to the wing when the trailing edge of the wing was swept forward.

Version 4.3.7  
9/13/00

Made default DTSTP equal to CBAR in patch assembly dialog. Added wing-body wake to wing portion of Object submenu. Fixed error in wing root meshing routine that made a mess when the number of fore or aft transition sections was greater than the number of wing root points. Made all wing patches come out with IDPAT=1 rather than 2. Corrected error in patch definitions for wing root meshes of bodies with wings partially emerging above or below them. Corrected failure to mesh port side of wing root intersection with offset body. Inserted protection against attempts to mesh a non-oblique port wing root intersection with a symmetrical body at BL=0. Corrected instances of IREV being assigned a value of 1 rather than 0 for non-reversed meshes (this had no ill effect on the analysis). Added "work" directory path to LFT.ERR. Made WI file reading routine continue despite failure to find a CWP file, ignoring the missing curvature information. Corrected error in section orientation in meshing of "vertical" curved wing panels. Revised method of indexing points in bridge patches.

Version 4.4.0  
10/11/00

Corrected failure to recognize symmetry in compound bodies when one or more ARB body files were read prior to two or more BOX files. Removed from patch reading routine the constraint that patch files must have a PCH extension. Corrected remaining instances of faulty post-millennial date formatting. Added ability to automatically create an input file for a wing and body with a wake.

Version 4.4.1  
11/26/00

Added graphic depiction to K Factor finding routine. Corrected faulty definition of fuselage intersection in bounded regions of curved wings. In Settings menu, changed "Intervals" to "Constants". Corrected failure to save canted section as SD file. Corrected failure to create valid fillet definition file. Corrected failure to locate some points in intersections between bodies and curved wings. Fixed problem defining locations of fillet tangent points on fuselage when the number of points in the intersection was other than 30. Corrected various problems with on-screen editing of fillet control lines. Forced leading edge parameters for upper- and lower-surface fillet control lines to match. Added fillet editing option to main edit menu and eliminated inappropriate menu selections and toolbar buttons from fillet editing display. Resurrected saving of 2D ribs. Removed "Append" from title of save dialog. Made save dialog options sensitive to selections in rib setup dialog. Made root mesh setup dialog accept .BTL file type for root intersection. Repaired problem in patch assembly created by auto-assemble modifications. Removed erroneous conversion factor in performance calculation that caused excessively high rates of climb.

Version 4.4.2  
12/16/00

Added "starboard side of vertical panel" option to wing segment meshes. Corrected problem finding leading-edge point in some intersections of a medial fin and a body. Added ability to read Selig airfoil format (alphanumeric title followed by coordinate list of unspecified length) as a plain coordinate list for conversion to SD format. Expunged all short reals. Corrected occasional refusal to perform body line editing.

Version 4.4.3  
1/1/01

Fixed erroneous K factors inserted after dragging ends in body line editing. Fixed error in line length matching in body bounded regions and in reading some coordinates from files (problems created when short reals were removed). Added patch numbering to automatically created input files. Accelerated procedure for computing and displaying planforms of wings with curved panels.

Version 4.4.4  
3/28/01

Removed aero, graf, math, gen, plot and loft linking libraries. Changed tool tip text for "Constants" to match menu. Revised performance routine to make calculated e the default and to disable e, prop efficiency, and sfc sliders when calculated values are being used. Added user filenames to performance data saving/restoring routine. Repaired faulty radio-button behavior in profile editing dialog. Corrected failure of LFT file reading routine to record the fact that a stored line segment is to have the signs of the Y components of its points reversed. Reversed sign of Y coordinates of points being read into a SEG file for a body of revolution. Fixed error in section order in patches on some inverted vertical wings. Revised method of calculating cross-sections when combining compound bodies. Corrected failure to mesh patches for wing sections with extremely thick trailing edges. Corrected failure of file reading routines to recognize a minus sign immediately following a colon as the beginning of a number.

Version 4.4.5  
5/3/01

Replaced "K Factor" label with "Curvature" in writing LFT files. Corrected faulty depiction of point sections when meshing non-symmetrical bodies. Corrected failure of Move Line command in editing procedure to effect a move under certain circumstances. Corrected failure to generate Cmarc input file from simple body. Added DENSITY to input file for added mass calculations. Changed "Screen" to "Options" in Settings menu. Added slow calc option for compound cross sections. Eliminated oblique bays. Corrected failure to erase old lines while animating moldline edits with a displayed cross-section. Made it possible to display a filed section as an underlayer on the same scale as a cross-section in order to match the two while editing moldlines. Added ability to import a bitmap as an underlayer for editing.

Version 4.4.6  
5/24/01

Corrected problem in converting B-type to A-type bodies. Added commands to bring nose and tail lines to a point when editing a new body. Added items related to flight path radius to input file for pitch damping calculations. Added ability to recognize ISES airfoil format files and to save airfoils in UIUC (X-foil) format. Fixed glitch in routine for changing the station count in SD files. Added figure of merit for similarity of wing sections with different station counts. Added screen repaint for main window only.

Version 4.5  
7/17/01

Corrected errors in wing dimension editing routine. Changed "Flow through" and "Flow around" to "Mesh through" and "Mesh around." Modified wing-body intersection routine to limit the calculation of the fuselage outer hull to the vicinity of the intersecting panel. Added polygon area function to Misc > Lines and Points. Added Include wings option to Area Distribution submenu for area ruling. Made area distribution graphs both printable and storable in tabular form. Improved calculation of minimum and maximum speeds in performance routine. Made data output window in tank volume routine wider and changed caption to clarify that results are for one wing only. Corrected improper spacing of wing root points on

wing bounded regions with body intersection at root and fore- or aft-cosine chordwise spacing.

Version 4.5.1  
9/14/01

Corrected faulty solutions for waterplanes. Modified routine for finding intersections of a line and a cross-section to account for the case of a point cross-section or zero-width strip. Added ability to panel a filed section independent of the currently loaded model. Added ability to save upper and lower edges of a wing root mesh in order subsequently to mesh, as a bounded region, an object such as a tip tank that intersects the wing on one side only. Corrected errors in the solution of port side wing root meshes and oblique wing root meshes. Added saving and retrieval of all dialog box data items to PAL (patch list) file.

Version 4.5.2  
10/10/01

Added error message for case of paneling a filed section when the number of supplied points is smaller than the number of desired panels. Added ability to read a filed list of shoulder points when finding a K Factor for a given line. Added point-slope method of finding intersection of two lines. Corrected failure of edit screen to display underlayer lines. Made functional the saving of WI and CWP files after editing curved wing panels. Corrected failure to terminate body/body intersection calculation after error message and user abort. Added ability to abort body/body intersection with <Esc>. Replaced a lot of "Increment too large" warnings with more detailed information. Added message regarding the possible need for manual editing after finding multiple body/body intersection segments.

Version 4.5.3  
12/4/01

Corrected copyright date. Modified WI file reading procedure so that when a curved wing panel is present, the WI file values control those items that are redundantly defined in the WI and CWP files. Improved wing editing procedure. Added wing break editing dialog accessible either by menu selection or by right-click on the break symbol. Disabled flap travel editing menu when an external-hinged or tracked flap is not currently loaded. Increased allowable length of airfoil names in WI files. Corrected some problems with wing root meshing. Made some initial file selection dialogs remember the last directory used.

Version 4.5.4  
3/12/02

Made file selection dialogs in performance routine remember the last directory used and automatically select the appropriate extension. Added bullet, ellipsoid, teardrop and airfoil options for starting body for editing. Made optional the automatic loading of wing or body files with names matching a specified body or wing file. Fixed problems with wing root meshing procedure for tip tanks. Modified moldline selection procedure to eliminate invalid options from list. Added "Copy point" and "Numbers" options to moldline editing. Added protection against zero or

negative step or increment. Corrected error in forming SD file name in slotted flap meshing routine. Corrected problem in reading the INI file when only wings, no bodies, had previously been loaded. Made "underlayer" selection in flap design routine use default directory. Corrected failure to display underlayer in flap design routine. Made wing field in wing root mesh setup dialog remember previous selection. Made output saving dialog present the current working directory as the default for the destination file. Made transition mesh setup dialog present the current working directory as the default location of the end section files. Ditto for build files. Corrected failure to save top, side and front views of waterplanes and intersections as 2D files.

Version 4.5.5  
7/3/02

Made file selection dialogs in tank routine present the current working directory as the default location of tank geometry files. Eliminated restriction to 8-character filenames. Added commands to flush file buffers at end of most file reads and writes. Added Michlet hull offset file fragment generation to hydrostatics. Improved column formatting in performance tabulation. Made .INI file rewrite after every change in the data file list. Made wing bounded region and body transition mesh dialogs use default directory for boundary file selections. Made directory entry routine supply initial backslash if user omits it. Corrected occasional failure on saving moldlines. Added code to LFT file reading routine to detect zero-length segments and straight segments that are defined as curved. Corrected wing root meshing routine to enable it to handle a non-symmetrical A-type body with the wing intersection on the port side. Corrected improper formation of flap section file names in flap definition routine. Prevented repetition of "No wake intrusion" message in wing-body wake routine. Added check to ensure closure of trailing edges of medial fins in wing root meshing. Corrected problem in calculating area distribution of body with multiple co-located wing or tail surfaces.

Version 4.5.6  
7/8/02

Repaired damaged code in generation of "oblique" wing root mesh for nacelles, booms, etc on tapered and/or swept wings. Corrected failure of wing-body intersection routine to work properly when the inboard wing break buttline coincides with the plane of symmetry of the body. Added report of erroneous digit read to "Bad break count" message in WI file reading routine. Added ability to supply a missing BL or WL coordinate for a filed list of points projected orthogonally upon a wing or body.

Version 4.5.7  
7/31/02

Fixed error in DXF saving of multiple moldlines. Fixed calculation of oblique wing root meshes when a mid-span wing break is located within the body. Revised meshing of deflected plain flaps to make panel edges coincide with hinge line. Improved algorithm for finding the location of automatically generated wing-fuselage intersections.

Version 4.5.8

9/16/02

Corrected failure to calculate horizontal cross-sections in certain bodies that use filed segments in moldline definitions. Added curvilinear interpolation and ability to add a point to a stored curve and optionally truncate the curve before or after the point. Fixed failure of patch reading routine if & is not preceded by one blank space. Removed jocular IGES intro text from SaveFS(). Provided clean return after Cancel in Michlet file selection. Added ability to split a patch into two patches at a given row number, and to delete ranges of columns or rows from a patch.

Version 4.5.9  
10/12/02

Revised operation of build files so that they are always stored in the permanent misc directory, and implemented through a Files > Load project menu option. Made file selection dialog in bridge patch routine default to current misc directory. Added option of resetting defaults to patch assembly dialog.

Version 4.6.0  
1/21/03

Modified save in body line editing routine to ensure that the name given by the user immediately replaces "NEW". Added file existence test to ensure that bodies or wings that are listed in the LM.INI file but do not exist are not included in the currently loaded items list. Corrected error in creating diaphragms in non-symmetrical bodies. Corrected file extension for inverted SD files in airfoil editing routine. Added detection and warning for filed segments (in LFT files) containing multiple points at the same FS or diminishing FS.

Version 4.6.1  
5/6/03

Corrected error in calculation of jet thrust variation with altitude and Mach number. Corrected errors in takeoff performance calculation for jets. Corrected failure to register wing name properly when automatically loading a wing along with a loaded body having the same name. Corrected failure to drag tangent in wing editing. Modified initial location of corners added to straight segments in wing editing. Corrected error in DXF saves of meshes of asymmetrical A-type bodies. Improved screen scaling for wing moldline editing routines. Reorganized "Files" menu and changed some wording in menus. Corrected error in reading LFT files that include copied moldlines containing filed segments. Corrected error in saving edited lines which was introduced in Version 4.6.0. Revised patch list saving routine to make use of a default list file, PATLIST.PAL.

Version 5.0.0  
11/26/03

Corrected failure to reset editing-wing flag to zero after leaving wing editing procedure. Corrected problems (detected by VC++ compiler) in wing root and bounded-region meshing, importation of filed patches,

display of multiple wings, and tank volume, area rule and K factor calculations. Corrected failure of first save after moldline editing to display the current file name. Removed Edit > Fillet option, which is already covered under Object > Wing fillet. Removed automatic invocation of PATLIST.PAT at the start of the patch assembly procedure. Corrected file closing error when the specified airfoil was not found by the WI-file-reading function. Eliminated or blanked non-functional menu items and toolbar buttons in demo and non-PSW versions. Corrected failure of hourglass cursor to be displayed during long body section- and patch-generating actions. Corrected failure to display moldline list for new A-type body. Added error message to wing rib routine to help identify cases where BL and WL should be swapped in CWP file. Corrected failure to cant ribs properly in inverted vertical curved panels. Correct several potential errors due to assignment to a string constant parameter in the file selection routine. Added option to save assembled input files using only Pmarc-12 namelist items. Compiled using Visual C++ 6.0 rather than Watcom 11a.

Version 5.0.1  
5/17/04

Corrected inability to gain access to other options in save dialog once Trueview had been selected. Added error message for "grid from four sides" mesh when grid points are not on the model surface. Added hinge moment calculation to flap design routine. Modified data file loading routine to allow simultaneous selection of body and wing files from a single directory. Corrected problems with oblique section routine that omitted topmost and/or bottommost points from A-type non-symmetrical sections. Corrected failure to initialize some Cmarc input parameters when an input file was automatically assembled for a wingless body with a wake. Corrected failure to display line list when creating and editing a new A-type body. Added 3DFACE option for DXF patch saves. Corrected error in determination of area and m.a.c. of wings with curved panels.

Version 5.0.2  
6/12/04

Corrected error in placement of 'kept' files and of saved file after conversion from 'kept.' Corrected error (new with version 5.0.1) in determination of m.a.c. of non-curved panels.

Version 5.0.3  
2/4/05

Corrected error in determination of fuel flow in performance routine. Corrected numbering of patches when IPATSYM=1 in assembly routine. Corrected crashes in deflected plain flap and slotted flap meshing routines. Changed default value of ITRFTZ in automatic input file assembly from 18 to 0. Corrected sporadic failure to discard duplicates from data files list. Corrected failure to read chord ratio from SD files. Added XML save option for airfoil data. Added "All" option to body intersections submenu. Fixed failure to save body or wing names to INI file when extension was omitted in the data files list. Changed default panel count in wing creation routine from 2 to 1. Corrected formatting of LFT file writing routine to avoid field overruns with numerically large (eg millimeter) dimensions. Added "Show all patches"

command. Added import and translation of patches from certain DXF file formats.

Version 5.0.4  
5/6/05

Changed spelling of XFOIL in profile editing form. Added space after line labels in LFT file writing routine. Modified performance calculation to prevent spurious effect of weight on Breguet calculations. Corrected crash after saving a body bounded region as a patch. Corrected crash in port side wing root mesh. Corrected crash in transition meshing when a bounding section has zero area. Corrected failure of transition mesh setup dialog to display previously selected section file names. Revised method of setting default directories for file searches and saves.

Version 5.0.5  
6/5/05

Changed initial default operation in profile editing to avoid accidental inverting of airfoils. Made non-primary wings display in different color than primary. Corrected error in filename construction that caused crash when no "misc" path was present. Added half-rib options to rib dialog. Added CCC=1.0 to default reset. Corrected crash in displaying wing bounded regions with "match both" specifier, due to failure to initialize patch label. Revised wing-wing intersection procedure for better integration with patch formation.

Version 5.0.6  
6/10/05

Revised compensation for sweep in the wing bounded region "match both" procedure. Corrected bug in display of wing patches that had been introduced in version 5.0.5.

Version 5.0.7  
8/12/05

Added horizontal scrolling to inconveniently small data entry fields in some dialog boxes. Supplied missing initialization of semispan for auto-assembly of body-only Cmarc input files. Corrected error in procedure for changing dimensions of curved wing panels. Eliminated default dimensions in new wing and new body creation dialogs.

Version 5.0.8  
10/8/05

Corrected error in certain segment deletions in body line editing. Corrected error in creating copied moldlines containing filed segments. Corrected faulty display of deflected flap mesh owing to bug introduced in 5.0.5. Corrected problem in reading airfoil body of revolution LFT files.

Version 5.0.9

11/3/05

Corrected failure of getini() to read file or path names containing spaces. Simplified file directory structure. Added "browse" option to wing file reading routine for missing section files. Corrected failure of wing bounded region routine to include a break rib as the outboard end of a region using a root intersection as its inboard end.

Version 5.1.0

11/25/05

Corrected intermittent failure to display LFT files by default in data file selection dialog. Eliminated category of "permanent" folders. Corrected creation of invalid filename when browsing in a new directory during output save. Eliminated differentiation between storage folders for LFT and WI files. Disabled "Folders" button and eliminated Settings > Directories menu choice. Converted LM.INI to new ("SD") file style. Added single-speed and step-size options to performance routine.

Version 5.1.1

12/22/05

Revised method of specifying row number for splitting patches. Eliminated distinction between "input" and "output" folders. Added "build" folder and made first button on toolbar the "Load new project" button. Corrected problem with formation of oblique sections in B-type bodies. Added auto horizontal scrolling to short edit fields in oblique section setup dialog.

Version 5.1.2

3/2/06

Corrected error in reading LM.INI, introduced by bug fixes in 5.1.1. Corrected erroneous display of leading and trailing edge locations in views of curved wing panels with nonzero incidence. Corrected memory freeing error in patch import routine. Provided more informative error message for section count mismatches in patch importing. Added error trap and message to patch saving routine to flag section count mismatches. Added STEP and INCREMENT to build file data. Added breakdown of CD into parasite and induced components to performance listing. Repaired default directory selection for patch file import in patch assembly routine.

Version 5.1.3

5/17/06

Improved import of ISES and UIUC airfoil files. Removed automatic update of performance list base speed with each parameter change. Fixed memory allocation bug in tank volume report listing routine. Corrected twisted outboard column in wing bounded region when the panel count is other than 29. Corrected errors in tutorial section of manual. Fixed bug that caused the full file name of a new body or wing produced in the editing screen to be saved as the current directory, rather than directory path alone. Added horizontal scrolling to data entry fields in patch edit dialog. Corrected failure to display e correctly and made knots the default unit in the performance listing. Made the directory to which

newly created bodies or wings are saved the new working directory. Changed all default K factors from 0.75 to 0.7071 in new body creation routine. Corrected failure to calculate MB with filed segment.

Version 5.1.4  
9/7/06

Revised wing fillet routine to eliminate error when wing leading edge emerged from fuselage at right angle to X axis. Fixed problem with retrieval of BTL and INT files in wing root meshing routine. Added line scaling to options in body editing routine. Added ability to define a curved panel by its planform. Corrected error in profile editing routine when using linear interpolation to create an SD file from points. Made profile editing routine display actual airfoil t/c ratio rather than value in SD file. Provided for redraw after moving dialog boxes in profile editing routine. Added leading and trailing edge stretch, leading edge droop and trailing edge reflex options to profile editing.

Version 5.1.5  
9/27/06

Corrected faulty out-of-range error in body cross-section routine. Fixed crash on leaving body editing screen after canceling out of moldline selection. Added moldline blending to body editing options. Corrected crash when editing a moldline whose ends did not coincide with those of the currently loaded compound body. Corrected erroneous handling of increment and step when writing a BLD file. Corrected failure of wing bounded region routine to save a properly formatted ASCII mesh file. Corrected failure to draw curved wingtip planforms correctly if the CWP file used the word "Curvature" rather than "K factor".

Version 5.1.6  
11/10/06

Corrected wing segment mesh for half vertical panels to show correct side. Changed wing bounded region mesh setup dialog to allow leaving outer limit file name field blank, in which case it defaults to the tip. Corrected failure to account for units other than statute miles per hour in performance routine when a single IAS is given. Corrected failure to calculate oblique sections because of uninitialized "hull" structure.

Version 5.1.7  
1/7/07

Corrected obscure problem finding certain wing-body intersections. Corrected failure with repeated calls, due to screen view changes, to wing bounded region mesh routine. Corrected failure to execute "mark points" option. Revised method of storing view history. Revised method of saving and restoring parameters for saving output. Provided dxf spline option for saving lines. Corrected implementation of DXF patch saves. Eliminated option of saving in AutoCAD script format. Added direct creation of generic wing .IN files. Implemented auto-adjustment of toolbar length with resizing of main window. Eliminated continuous shrinkage when panning after MOOZ. Add inside/outside color to imported mesh display.

Version 6.0.0  
7/12/07

Corrected failure to recognize LFT, WI, CWP and SD file names containing spaces, as well as "filed segment" names containing spaces and CWP file names of more than 8 characters. Added color selection dialogs and palette files. Revised rotations to eliminate planelet. Implemented "viewlist" storage of onscreen lines and surfaces. Added opaque/transparent mesh option. Added patch merging capability. Added support for reading and writing Panair network files. Added automatic splitting of patches along wake separation line in wing root meshing routine. Made it possible to import multiple patches with a single selection, as well as files of other types. Enlarged output window for fuel tank analysis.

Version 6.0.1  
8/24/07

Corrected failure to construct an IN file from a selection of patches and to auto-assemble an IN file from current data files, and failure to close trailing edges of bounded-region wing patches (all three problems originated with version 6.0). Added a conservative parasite drag multiplier to the performance calculation to account for pressure drag effects of increasing alpha.

Version 6.0.2  
8/25/07

Corrected mismatch between node locations on wing bounded region and corresponding body meshes.

Version 6.0.3  
9/16/07

Improved protection against duplications in current-file-name list. Corrected failure to set TNODS=5 after last section in auto-assembly from a single wing file. Revised algorithm for leading edge droop to distribute radius of curvature of the chord line equally along the drooped portion. Implemented display of profiles using viewlist. Corrected unintended erasure of flap display after some commands. Restored grid display after animating flap. Corrected misbehavior of screen clearing at launch of program. Added movement-direction cursors to flap definition routines. Selectively disabled irrelevant options in flap design setup dialog.

Version 6.0.4  
9/29/07

Added editing capability to list display.

Version 6.0.5  
11/19/07

Set default precision to 3 for millimetric scaling. Modified wing-body intersection routine for wing protruding from left side of a body but defined left-to-right. Added test to WI file-reading routine to trap improperly defined panel rib angles. Corrected failure to display moldlines after displaying certain meshes.

Version 6.1.0

11/26/07

Added scratch window to list editing control. Corrected location of m.a.c. on displays of vertical surfaces. Reduced size of CG icon. Made default names of SD and build directories "\airfoils" and "\build." Enlarged fields in data file list.

Version 6.1.1  
1/2/08

Corrected failure to update section point count for wing segment meshes. Corrected failure to properly mesh port wing and some vertical panels. Fixed some, but not all, problems with wing editing display. Provided WI option for auto creation of generic wing IN file. Caused all currently loaded lines to be displayed on startup. Made auto-assembled IN file geometry visible after saving.

Version 6.1.2  
4/9/08

Added protection against illegal frame drags in body editing. Corrected problem with display of lines when editing A-type body. Added filtering for non-ascii characters to data file reading routines. Cleaned up handling of Planform option in curved wing panels and revised manual. Modified build-file reader to handle incomplete file paths after initial installation. Corrected buffer overrun in DeliverInt(). Provided protection against attempting to print or list a mesh. Enlarged many character buffers to accommodate long file names. Temporarily disabled "rib segment" component of wing-wing intersections. Corrected crash after listing of wing geometry. Made it possible to open List/Edit window at any time. Eliminated CR-CR-LF character sequence in files saved from List/Edit window.