SPost V6.7 - What's New

FORWARD:

This document was created by extracting only SURFCAM-specific changes from AustinNC developer notes for their G-Post® V6.7 postprocessing software shipped under the trade name "SPost" with all SURFCAM Traditional software.

The original AustinNC developer notes were in implementation order, however, this document has this same information grouped as shown here:

- G-Post Generalized Post Processor
  - Command-Specific Improvements
  - Machine-Specific Improvements
  - Auto Repositioning Improvements
  - Planar Machining Improvements
  - Miscellaneous Improvements
- Option File Generator
- FIL (Factory Interface Language)

Don McKillop, CAMCAD Technologies, Inc.
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NOTE: All mistakes are mine.

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SPost V6.7 - What's New

1. G-Post - Generalized Post Processor

1.1. Command-Specific Improvements

1.1.1. ARCSLP Pos-Neg Scaling

- New common has been added for the flag to scale **ARCSLP/ON,z** value by the current tool axis vector to avoid G2/G3 helical motion along the wrong spindle axis in some cases. This may happen when the helical motion is along (0,0,-1) tool axis for a toolpath from CAM system.

  Intcom (4764) settings:
    - 0 = Do not scale **ARCSLP/**z-value (Default)
    - 1 = Scale or Multiply **ARCSLP/**z-value by the current tool axis vector

  Integer Common location added: IHLXSCALVEC ,INTCOM(4764)

1.1.2. ARCSLP Missing Z Move Correction

- When the end point correction is set in the circle panel of Optfile, a circular motion with ARCSLP/ON did not change Z-axis motion for the helical move. It stayed at the last Z as constant. This has been fixed.

1.1.3. CIRCLE 360 Degree Tolerance Check

- The option to test for 360-degree circle tolerance by using the Option file circle panel was not converted for Metric input. This caused very close start-end points of a **CIRCLE/**cmd in the CLfile to make incorrect G2/G3 output. This has been corrected.
- In some cases, tiny arc segments in the CL file **CIRCLE/**cmds were not processed correctly. This has been corrected.

1.1.4. CIRCLE with ABC output

- When CL-XYZ with ABC output is selected on the Option file Transform & Output page for a 5-axis machine with a C-axis table, the C-axis may not be at zero for a (0,0,1) tool axis vector with the option set not take C-axis to zero. In that case, a G2/G3 did not output the proper IJK in CL-xyz coordinates. This has been corrected.

1.1.5. CUTCOM/LEFT-RIGHT with PQR compensation

- The command **CUTCOM/LEFT,XYZ**, for a 5-axis Cincinnati PQR compensation, was not working correctly. It worked only with the **CUTCOM/XYZ** command and not with the **LEFT-RIGHT** options. This has been corrected.

1.1.6. GOTO/x,y,z,0,0,0 support

- User can place a **GOTO/x,y,z,0,0,0** line in a FIL file. This **GOTO** has a bad tool axis vector and caused a floating point runtime error in some cases. G-Post has been corrected to output a warning and use the last tool axis vector.

1.1.7. LOADTL - first move ABC modality control

- When INTCOM (1524) is set in the Option file to output ABC after **LOADTL/**cmd, G-Post sets it to 2 to output ABC on the next **GOTO** after **LOADTL** and then sets it back to 1. Otherwise, ABC will be output for all **GOTO/**pts from that point forward. You can now manually set INTCOM (1524) to 2 in FIL, to force ABC with next **GOTO/**pnt. It will automatically be reset to 1 after the **GOTO/**pnt by the G-Post.

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SPost V6.7 - What's New

1.1.8. REWIND/PUNCH Discard NC File

- The **REWIND/PUNCH** command to discard the PU1/tape file failed in some Windows server environments. This has been fixed.

1.1.9. SELECT/XY|YZ|ZXPLAN command

- Added a new MILL only command to G-Post, **SELECT/XYPLAN-YZPLAN-ZXPLAN.** If your control has multiple plane selections for circular interpolation, this command will set the desired plane mode and output the G-code G17,G18 or G19 or as set in the Option File. You can optionally issue this command to reset the mode back to G17 at each tool change. The default is G17 at the start unless changed in the Option File Generator Start/End of Program/Default Prep Codes screen.

  Example:

  ```
  CIMFIL/ON,LOADTL
   DMY=POSTF(13)      $$ PROCESS LOADTL
   SELECT/XYPLAN      $$ RESET PLANE TO G17
  CIMFIL/OFF
  ```

1.1.10.   SEQNO/LAST Applies To Included NC Code

- Added a new sequence numbering command **SEQNO/LAST**. This command will allow you to re-sequence the PU1/TAP file at **FINI** after all processing is done. This will permit you to include external files that have different sequence numbers (N) and then re-sequence them in order for the current PU1/TAP file. This is similar to the config.tbl option UNCMRG_RSQ=ON, except it does not need to be a merging post.

  NOTE: This command can be given any time in the input or FIL file, but will only be used once at FINI by the G-Post. Once used, it cannot be turned off. Also, only blocks with N-number will be re-sequenced.

1.1.11.   SET/HED Soft Cycle Correction

- Using a **SET/HED** command for the right angled head function with a C-table/A-table machine tool type, a soft drilling cycle with G0/G1 motion did not work correctly for a (0,0,1) tool axis. This has been corrected.

1.1.12.   SET/HED with C-Table, B-Head machines

- For a 5-axis C-table, B-head machines, the right angle head command **SET/HED,n,x,y,z,POSX** did not output the B-angle correctly. It works OK for **NEGX** but not for **POSX**. This has been fixed.

1.1.13.   THREAD/AUTO generates multiple G33 blocks

- With mill-turn mode enabled, a **THREAD/AUTO** command from FIL fails with a warning message. This has been corrected to expand **THREAD/AUTO** and output multiple G33 blocks similar to lathe post.

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SPost V6.7 - What's New

1.2. Machine-Specific Improvements

1.2.1. Nutator B-Axis tilt control

- A 5-axis C-table/B-table Nutator machine can have a B-axis tilt angle from the XY plane centerline like on the DMUxx Evolution machines. This offset angle can now be set in Double Common DBLCOM (1121). For example it can be set to -45 degrees to compensate for this configuration. The default setting for this common is zero (0).

  Dblcom (1121) settings:
  > Default = 0
  > Range = +/-359.999

  Double Common location added: DMU5AXYTLT ,DBLCOM(1121)

1.2.2. Nutator Repos improvement

- When using a Retract/Approach distance set in the Automatic Reposition panel with a C-table with B-Nutator head machine, the post did not retract correctly and/or output the CB-angles. This has been fixed.

1.2.3. Nutator ABC oscillation correction

- For C-table, B-head Nutator Machines, sometimes the ABC angles generated the opposite side for the same tool axis **GOTO/**pts in succession. This has been corrected to output the same last ABC angles.

1.2.4. Nutator overtravel warning

- For a 45 degree Nutator rotary axis, the K-component of tool axis cannot be negative which will exceed the maximum possible angle of 180 degrees. A warning message has been added when K is negative in a GOTO/pnt.

1.2.5. MillTurn with MULTAX/OFF

- With **MULTAX/OFF**, G-Post would switch to a mill-turn machine (Type-7) from a 5-axis CB table-head machine with mill-turn option enabled in some cases. This was done after Build=176. It caused a regression by generating G01 code instead of G03 code in the ZX-plane with **MODE/YAXIS,AUTO** and worked OK with **MODE/YAXIS,ON**. This has been corrected for both **MODE/YAXIS,ON-AUTO** commands.

1.2.6. MillTurn multi-block helical output

- For a mill-turn machine (type-7) with Y-axis, a helical move with **ARCSLP/ON,z** Z-axis output was not correct. This happens when the helical-circular move has more than one block meaning the cut was more than 360 degrees. This has been corrected.

1.2.7. MillTurn LINTOL radial moves

- For a type-7 mill-turn machine, the **LINTOL/ON** output for a radial move across the X-axis (from +1 to -1) was not correct. This has been fixed.

  Example:

  CL file input:

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```
RAPID
GOTO / -6.2400000000, 0.0000000000, 3.5000000000
RAPID
GOTO / -6.2400000000, 0.0000000000, 3.3500000000
FEDRAT / 48.000000,  IPM
GOTO / -6.2400000000, 0.0000000000, 2.9000000000
GOTO / 5.7400000000, 0.0000000000, 2.9000000000
RAPID
GOTO / 5.7400000000, 0.0000000000, 3.5000000000
```

Punch file output:

```
N10 G0 X6.24 Y0. C180.
N11 Z3.5
N12 Z3.35
N13 G1Z2.9 F106.667
$$ RADIAL MOVE FROM X-6.24 TO X5.74 - NOW HAS 3-BLOCKS N14-N16
N14 X0.F 7.692
N15 C0.F 7.692
N16 X5.74 F8.362
N17 G0 Z3.5
```

1.2.8. MillTurn MODE/YAXIS,OFF - LINTOL improvement

- With **MODE/YAXIS,OFF** in a 5axis-CB machine with mill-turn option, **LINTOL/ON** output will now match the XC data as output by a normal 3-axis type-7 mill-turn machine. Before, excessive amount of XC intermediate blocks were output for **LINTOL/ON**.

1.2.9. MillTurn MODE/YAXIS,ON-OFF

- For a 5axis C-Table B-Head machine with mill-turn mode the Option file now has the option **MODE/YAXIS,ON-OFF**. Before, Y-axis was always enabled and user had to give the command **MODE/YAXIS,OFF** in the input file. A new common Intcom (4623) has been added to indicate that user has set the Y-axis mode by visiting Option File Generator Mill panel in the Mill-Turn section.

  Intcom (4623)
         0 = No (Default)
         1 = Yes

  Integer Common location added: IVSTMILPN ,INTCOM(4623)

  NOTE: Do not set this location in the FIL file; it is an internal flag for G-Post.

1.2.10.   MillTurn MULTAX/OFF correction

- Many CL files have **MULTAX/OFF** at the start of operation. With **MULTAX/OFF** and **MODE/YAXIS,OFF** in a 5axis-CB machine with mill-turn option, does not output proper XC data. G-Post will now switch to standard 3 axis type-7 mill-turn machine automatically to output correct XC and switch back.

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1.2.11. MillTurn plane selection code output

- For mill-turn machines, switching to **MODE/TURN** after **MODE/MILL** may output G17 code. Some machines do not process G2/G3 with G17 and XZ coordinates for turning. This has been corrected.

1.2.12. Gantry with X-Axis offset - output corrected

- For a 5-axis gantry with CB dual rotary head machine with an offset along the X axis is set on the secondary panel, the XY output was not correct. It also offset along the z-axis. This is a legacy issue, which has been corrected. The default setting for Intcom (2098) in this case is zero (0), to output correct XY offset, if you want the legacy output then set Intcom (2098) to ten (10).

1.3. Auto Repos Improvements

1.3.1. Auto Repos - Optimization - user blocks handling

- When Optimization is turned ON with auto-repos, if any user blocks are defined, they were output during the optimization tries. They should only output after optimization and during actual repos motion. This has been fixed.

1.3.2. Auto Repos - Optimization - tap cycle correction

- When Optimization is turned ON with Auto-Repos, the current spindle speed was not used for **CYCLE/TAP,…** command in some cases. The F-value output with **IPM** conversion for the programmed **IPR** was not correct. This has been fixed.

1.3.3. Auto Repos - FROM record handling

- When ignore all **FROM/**cmds is set for Plabel 45on Option File Generator, 5th Plabel panel, a FROM was still processed when Automatic Reposition was enabled in the axes limit panel. This has been fixed.

1.3.4. Auto Repos - added tool axis control

- When Automatic Reposition does Approach/Retract motion, the old tool axis from the last **GOTO/**pnt is used for the alternate position after the retract move. However, this may not be possible on some of the 5-axis machines. You can set this flag to use the new tool axis of the current **GOTO/**pnt that caused the limit error after the retract move.

    Intcom (4765) settings:
    - 0 = Use old tool axis of last point (Default)
    - 1 = Use new tool axis of next point

    Integer Common location added: IRPOSARTLXF ,INTCOM(4765)

1.3.5. Auto Repos - out of limit correction

- In some cases, the auto REPOS generates A-axis out of limit during the interim repos moves. V65 had an option to skip ABC out of limit with I4749=1, which was not working correctly. This has been corrected now.

SPost V6.7 - What's New

1.3.6. Auto Repos - incorrect retract for metric option file

- When no retract is set in Auto-Repos, a large retract move was output when out of limit in some cases. If the option file is metric, the large value (no retract -9999) was converted to metric units instead of skipping the retract motion. This has been fixed.

1.3.7. Auto Repos - LINTOL Suppression

- A new Integer Common Intcom (4755) was added for a 5-axis machines, the first point may miss auto-repos and select the rotary axis out of limit position. This happens when **LINTOL** is enabled as G-Post finds the closest point to current position in the linearization logic. An option has been added to skip the linearization temporarily for this **GOTO/**point in limit.
  Intcom (4755) settings:
    - 0=No
    - 1=Yes
  Integer Common location added: IRPSLINTOLF ,INTCOM(4755)

1.4. Planar Machining Improvements

1.4.1. Planar Machining - euler angle resolution

- When the Planar Machining panel is set to "Output Euler angles IJK", G-Post will round the IJK Euler angles to 3-decimal places for the rotation around the XYZ-axes before output as IJK values to the tape file.

1.4.2. Planar Machining - FIL access to ABC angles

- Added Double Common locations to store the ABC angles output by 3+2 Planar Machining in the positioning (G0) and planar (G7/G68/etc.) blocks. These can be retrieved in a FIL file from the Dblcom (1115-1120) locations.

  Dblcom (1115-1117) settings:
    - Planar machining Positioning block (G0) angles output for ABC axes after PIVOTZ/ON
    - Default = 0
    - Range = +/-99999.0

  Double Common location added: DCSYSG0ABC(3), DBLCOM(1115-1117)

  Dblcom (1118-1120) settings:
    - Planar Machining Rotation block (G7/G68/etc.) angles output for ABC axes after PIVOTZ/ON
    - Default = 0
    - Range = +/-99999.0

  Double Common location added: DCSYSG7ABC(3) ,DBLCOM(1118-1120)

1.4.3. Planar Machining - near vertical tool vector

- In some cases, when the **GOTO/**vector has K value near zero (0), G-Post output for XYZ in planar machining was not correct. The matrix found by G-Post had accuracy errors in conversion to a "0,0,1" vector. This has been fixed.

SPost V6.7 - What's New

1.4.4. Planar Machining - Euler - Small Angle Round-Off

- When Euler Angles option is set for Planar Machining, small angles in IJK (less than 5) may be output as zero due to round off. This has been fixed.

1.4.5. Planar Machining - Corrected Positioning Move

- When planar machining is on and G00 positioning move before the G07/G68 3+2 machining block is set, the G00 ABC angles were not output correctly in some cases. This happens, if the CSYS matrix is similar to the last one. This has been fixed.

1.5. Miscellaneous Improvements

1.5.1. Linearization - expanded options

- A new Integer Common Intcom (4761) was added as a flag to use newer linearization methods. The Option File Generator will have 5 linearization methods to choose from.
  Existing:
  1. Distance method uses an iterative incremental angle from start to end.
  2. Distance with mid-point method uses an iterative scheme by dividing the distance by a mid-point from start to end.
  3. Distance with angle method uses the same iterative mid-point with an added constraint of the tool axis change is limited to the angle specified in between points.

  New:
  4. Equal number points method will divide the distance from start to end to have the specified number of points and find a fixed segment distance to be output.
  5. Equal distance method will divide the distance from start to end to have the specified fixed segment distance and find number of points to be output.

  Intcom (4761) settings: Only used if the new LINTOL (4 or 5) is set in the Option File Generator.
  >   0=no (Default)
  >   1=yes, use distance with number of points
  >   2=yes, use equal distance segments method

  Integer Common location added: ILNTOLMETHD ,INTCOM(4761)

- A new Integer Common Intcom (4762) was added as a flag to check for a singular axis move for linearization motion to a point. For example, A-table machine with X-axis and A-axis move would be a singular axis move. Under this condition, the regular linearization algorithms may not converge and/or generate proper **LINTOL** intermediate points. Optionally, the move can be skipped or output n-number of intermediate points at equal distance from start to end point.

  Intcom (4762) settings:
  >   0 = No (Default)
  >   1 = Yes
  >   n = Output n-number intermediate points (n=2 to 99)

  Integer Common location added: ISNGLINTOLF ,INTCOM(4762)

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SPost V6.7 - What's New

- Flag to indicate **WARNING** to be output in one or two lines. A new Integer Common, Intcom (4763) has been added.

  Intcom (4763) settings:
  - 0=Output in one line (Default)
  - 1=Output in two lines as in V6.6 or earlier versions

  Integer Common location added: IWRNGOUTPTF ,INTCOM(4763)

1.5.2. Upper - lower case conversion

- Some CNC Controllers want upper or lower case alpha characters and not in mixed mode. We have added a new Integer Common, INTCOM (4766). This can be set to convert the tape file to upper or lower case at FINI. **NOTE:** Use only if it is needed.

  Intcom (4766) settings:
  - 0=No conversion (Default)
  - 1=Convert to upper case
  - 2=Convert to lower case

  Integer Common location added: IPCHUPLWCASE, INTCOM(4766)

1.5.3. Unclamping with G93 1/Time

- When G93 option to skip auto-clamp Intcom (4647) is set in the Option File, sometimes the first ABC move after G93 may still be clamped but needs an un-clamp M-code. This has been fixed.

1.5.4. GPost Mill - Extra INSERT Line in LST

- An extra line of the INSERT/chars was printed to the LST file. This has been corrected.

1.5.5. GPost Mill - CIRCLE vs. GOTO IJK Resolution

- Under MULTAX case, the circle-axis and the GOTO/tool-axis must match to output G02/0G3 for circular motion in the Clfile, if they do not match, then G01 will be output.
- To avoid the G01 output, GPost has been updated to test for the match within the vector tolerance as set in the Optfile machine spec panel. You can set it a small value like 0.000005 to avoid G01. Default is zero as before.

1.5.6. GPost Mill - Closest Resolve Correction

- For 5-axis A-Table,B-Head machine the closest resolve to select shortest AB rotation from the previous GOTO/pnt did not work correctly in some cases. It rotated the A-axis by 180 degrees back and forth for successive GOTO/pnts. This has been corrected in Build=0243 of Mill GPost EXE file.

1.5.7. GPost Lathe - Missing Spindle M03

- In some cases, the Spindle on code M03 was not output if the direction was same as before. This has been corrected to output M3/M4 always.

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SPost V6.7 - What's New

1.5.8. GOTO Vector Trim Tolerance

- Toolaxis vector IJK can be close to unit one like 0.99997 which may cause unwanted large ABC-angle rotations especially on machines with rotating tables. This tolerance value is used to round that IJK component to the value one. For example, if K-component is 0.99997 then a tolerance value of 0.0005 will round up K=1 and will make the toolaxis as (0,0,1).
- Default=0, not to test for this condition.
- New Common:
- This tolerance value is stored in a new double common location and can be set in the Optfile Machine panel under the Vector Tolerance box.
- EQUIVALENCE   (UVECTOL   ,DVARAB(1122))

1.5.9. FIL - Upper-Lower Case Letter Z Conversion

- When CONTRL/UPPER_CASE=OFF set, Letter z is output as % with the following REPLAC/cmd.

```
CONTRL/UPPER_CASE=OFF
T1=TEXT/'G0';T2=TEXT/'Axyz 0';REPLAC/T1,T2
```

- This has been fixed to output "Axyz 0" instead of Axy% 0" for "G0"

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SPost V6.7 - What's New

2. Option File Generator

2.1. OptFile - Output CLfile XYZIJK

When CLxyz-IJK output is selected in Optfile/Machine/Output panel, GPost still generated ABC angles instead of IJK. This has been fixed.

2.2. OptFile - Fixture Offset Panel

Re-design the fixture offset panel for more clarity and make the old SET/gg,ADJUST,hh command as legacy or obsolete command.

06-22-17 vns; New panel for both mill and turn

-------Fixture Offset---

  [ ] Offset Address   ----Output Type--------

  [ ] Base Value to be added   <Same 3-options as before>

  /? help

2.3. OptFile Mill -Fixture Offset Panel

Offset Address: By default, SELECT/n offset is applied to H-code without M06 for a tool change. So leave the address as H, if this is desired.

Or if you want an offset with G-code, then Select letter address G to output G54 for SELCT/54 command and G53 for SELECT/53 command. Or select an extra letter address like E and Alias it as "G54P" in the MCD file panel to output G54P1 for SELECT/1 command. Default is 05 for H. Intcom(496)

Base Value: Specify a base value like 53, which will be added to SELECT/1 command to output G54 and SELECT/0 will output G53 to turn off fixture offset. If you use SELECT/53-54 type command, then leave the base value as zero. Default is zero. Intcom(3434)

2.4. OptFile Lathe - Fixture Offset Panel

Offset Address: By default, SELECT/n offset is applied to T-code without indexing the turret. So leave the address as blank, if this is desired.

Or if you want an offset with G-code, then Select letter address G to output G54 for SELCT/54 command and G53 for SELECT/53 command. Or select an extra letter address like E and Alias it as "G54P" in the MCD file panel to output G54P1 for SELECT/1 command. Default is 00 for T. Intcom(496)

Base Value: Specify a base value like 53, which will be added to SELECT/1 command to output G54 and SELECT/0 will output G53 to turn off fixture offset. If you use SELECT/53-54 type command, then leave the base value as zero. Default is zero. Intcom(3434)

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SPost V6.7 - What's New

*** If Intcom(3427) == 0, then show the new SELECT/panel ***

*** If Intcom(3427) == 1, then get after a confirmation

"Your Optfion file is set to use the legacy SELECT/gg,ADJUST,hh command, Do you want continue to use this mode (Y/N)?"

*** If the answer is Y, then show old SELECT/panel ***
*** If the answer is N, then, set Intcom(3427)=0 and show the new SELECT/panel ***

Mark Obselete Intcom(3427-3430) and Intcom(3432)

Mark Obselete Dblcom(923-925) for Mill and Dblcom(1607-1609) for Lathe

Mark Obsolete SELECT/gg,ADJUST,h command in GPost manual.

New Common:

    The base value is now stored in the existing common location:

    EQUIVALENCE   (ISELG   ,IVARAB(3434))

2.5. Siemens CYCLE81

For Siemens **CYCLE81** using **ROT** and **TRANS** for **MULTAX** mode, added new options for **TRANS** xyz to be in machine or part coordinates.

Option File Generator Motion/Cycle/Siemens 840D panel was changed to allow for this new option.

Tilt Angle ROT cycle for MULTAX
  o Do not output ROT cycle format (default)
  o Output ROT cycle format for any tool axis
  o Output ROT and TRANS cycle format for any tool axis, TRANS xyz=Machine
  o Output ROT and TRANS cycle format for any tool axis, TRANS xyz=Part

2.6. Nutator Head Control

A new Integer Common Intcom (4756) was added for C-table/B-head Nutator machines, the CB angles are not correct for some of the machines like DMG models. A new flag has been added to use the head-head method to find the ABC angles as desired.

Intcom (4756) settings:
    0=No
    1=Yes
    2=Yes, Also offset C by 90-degress in the XY-plane

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SPost V6.7 - What's New

Integer Common location added: IPRT4CABANG ,INTCOM(4756)

2.7. Planar Machining

New CSYS option panel has been added to the Option File Generator on the Machine Tool Type/Planar Machining menu. Four new Integer Commons have been added for this feature, Intcom (4757-4760).

Intcom (4757) settings: Flag to indicate type of CSYS/matrix for planar machining as forward/reverse.
       0=Forward, CSYS/matrix will convert input GOTO to local system (default)
       1=Reverse, CSYS/inverse matrix will convert input GOTO to local system

Integer Common location added: ICSYSMXTYP ,INTCOM(4757)

Intcom (4758) settings: Flag to select the ABC angles that are within limits for planar machining.
       0=do not check limits (Default)
       1=output opposite angles that may be in the limits

Integer Common location added: ICSYSABCLM ,INTCOM(4758)

Intcom (4759) settings: Flag to indicate how to use Z-vector from CSYS/matrix for planar machining.
       The default is the preferred mode.
       0=Let GPost determines the Z-vector (Default)
       1=Use Z-vector from the CSYS/inverse matrix

Integer Common location added: ICSYSZVECF ,INTCOM(4759)

Intcom (4760) settings: Flag to set the Euler angle XYZ order.
       Euler angles in mathematical terms can be based from the intrinsic order of rotation with XYZ axes. The most commonly used is order is ZXZ, which is the default in the G-Post. This flag can be set for desired order to find the Euler angles for planar machining output. There are the 12-possible angles for any given CSYS/matrix, which can be specified by n=1 thru 12.
       0 = Use common ZXZ order (Default)
       n = Use desired order 1-12 (1=XYZ,2=XZY,3=YXZ,4=YZX,5=ZXY,6=ZYX)
                          (7=XYX,8=XZX,9=YXY,10=YZY,11=ZXZ,12=ZYZ)

Integer Common location added: ICSYSEULRP ,INTCOM(4760)

2.8. Nutator Head Control

A new Integer Common Intcom (4640) was added for 5axes B head/A head machine with Nutator to support the Selca & Mecof 45 degree nutating head, which has a different A axis output.

Intcom (4640) settings:
       I4640=0 Normal A-Nutator (Default)
       I4640=1 Mecof machine A-Nutator
       I4640=2 Selca machine A-Nutator

Integer Common location added: IMECOFHED ,INTOCM(4640)

SPost V6.7 - What's New

2.9. Opt File - Upper/Lower Case Time Stamp

When the Time Stamp option is enabled, the Date and Time string was output in lower case characters. This has been changed to be in upper case as: (DATE:09/11/17 TIME:15:27:20)

    Add Optfile new option: Both Mill and Lathe Optfile File format/General
    Address output panel below Inset blank option:

    --- Option for Upper/Lower case characters in Tape file -------

    Intcom(4766) setting:

    0=No conversion (Default)
    1=Convert to upper case
    2=Convert to lower case

    New common location:

    EQUIVALENCE(IPCHUPLWCASE,   IVARAB(4766))

    ?/ Help

Most of the NC controls will accept both upper and lower case alpha characters in the tape file PU1 or TAP etc. Some Controls may want only upper or lower case alpha characters and not in mixed mode.

Use this setting and GPost will convert the tape file to upper/lower case at the end of processing.

NOTE Use only if it is needed by your control as it is an extra step in the processing, which may not be needed.

SPost V6.7 - What's New

3. FIL (Factory Interface Language)

3.1. INSERT_PUN_FILE

A new **INSERT** command to include an external file into punch file at **FINI** has been added for use inside the FIL file, **INSERT_PUN_FILE=filename**. This is a special **INSERT** command to include an external ASCII text file into the punch/tape file when the post reads the **FINI**. The file name to be included is given after the = sign in the above **INSERT** command and may be any valid Windows file name up to 56 characters, it may not include spaces. This is a fixed field command, meaning the command word **INSERT_PUN_FILE=** must be in columns 1-16 of the line and the **filename** must be in columns 17-72 for a maximum of 56-chars without any blanks. The use of the End of Block character ($), the **INSERT** continuation character or $$ comments are not allowed. The inserted file cannot have another.

INSERT_PUN_FILE= command inside it, as a recursive **INSERT** is not allowed. The external file will be included after all processing has been completed, when the **FINI** is read by the G-Post. The data in this external file will be inserted into the punch file at the location where the physical I**NSERT_PUN_FILE = filename** is located. This will allow you to **INSERT** data anywhere in the punch file including the top of the punch file. The data in this external file can be hard codes or it can be gathered during processing like and written to the file. Usage of this command could include a tool list, a total machine time comment or rotary table angle rotations for fixture offsets.

NOTE: Using this command, you can avoid redirecting punch file by using **XX=POSTF(25,x)** in the MACHIN section and then rewind and use **XX=FILEF(…)** read/write to the punch file at **FINI** section in FIL. Using this command you can let the G-Post handle this internally. Since this **INSERT** is done at **FINI**, any **REPLAC/**cmds in effect will not be applied to the external files that are added to the punch file.

Example: Using this command to INSERT an existing file.

The contents of the file PROBE_CMD.TXT:

```
START PROBE-XYZ
G65 XYZ[PROBE]= 1.1 2.2 3.3
STOP PROBE-XYZ
```

FIL file coding:

```
TLCHN=0
CIMFIL/ON,LOADTL
  DMY=POSTF(20)
  TLCHN=TLCHN+1
  IF(TLCHN .EQ. 1) THEN    $$ FOR 1ST TOOL CHANGE INSERT ABOVE PROBE FILE
   INSERT_PUN_FILE=PROBE_CMD.TXT
  ENDIF
  DMY=POSTF(21)
  DMY=POSTF(13)
CIMFIL/OFF
```

Punch file output:

SPost V6.7 - What's New

```
O1234 (TEST)
G90
G17
G00
START PROBE-XYZ
G65 XYZ[PROBE]= 1.1 2.2 3.3
STOP PROBE-XYZ
T01 M06
etc...
M02
```

Example: Using this command to INSERT a file created by FIL with info from processing.

FIL file coding:

```
TLCHN=0
CIMFIL/ON,LOADTL
  DMY=POSTF(20)
  TLCHN=TLCHN+1
  IF(TLCHN .EQ. 1) THEN     $$ FOR 1ST TOOL CHANGE INSERT B-ANGLE FILE
   INSERT_PUN_FILE=B_ANGLES.TXT
  ENDIF
  DMY=POSTF(21)
  DMY=POSTF(13)
CIMFIL/OFF

ROTBN=0
CIMFIL/ON,ROTABL
  DMY=POSTF(13)
  ROTBN=ROTBN+1
  IF(ROTBN .EQ. 1) THEN     $$ FOR 1ST ROTABL MAKE INSERT B-ANGLE FILE
     T1=TEXT/'B_ANGLES.TXT'
     DMY=FILEF(1,7,T1)
     IF(DMY .EQ. 1) THEN    $$ DELETE IF THERE
        DMY=FILEF(1,2,T1)
        DMY=FILEF(1,6)
     ENDIF
     DMY=FILEF(1,3,T1)      $$ MAKE NEW FILE
   ENDIF
  BVAL=POSTF(1,3,(291+2))  $$ GET CURRENT B-ANGLE
  T1=TEXT/'G10 L20 B',BVAL
  DMY=FILEF(1,1,T1)        $$ WRITE B-ANGLE TO NEW FILE
CIMFIL/OFF

CIMFIL/ON,FINI
  DMY=FILEF(1,5)           $$ CLOSE B-ANGLE FILE FOR POST TO INSERT AT FINI
```

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SPost V6.7 - What's New

```
   DMY=POSTF(13)
CIMFIL/OFF
```

Punch file output:

```
O1234 (TEST)
G90
G17
G00
G10 L20 B0
G10 L20 B45
G10 L20 B90
T01 M06
S300 M03
etc...
M02
```

3.2. FILEF Append

When using the append mode to open a file with **XX=FILEF(n,8,t1)**, it failed with very large files (too many records in file=**t1**) to re-position to the bottom of the file correctly for a new write. This has been fixed.

3.3. TEXT/TIMES

Added 5 more optional 2nd arguments to **TEXT/TIMES,n (n=10,11,12,13,14)**. When n equals 10 thru 14, the output is as it is for n=0 thru 4, except it will return the month as 3-character alpha (JAN,FEB...DEC) instead of the 2-digit month to match local date format and/or clarify the month.

Example:

```
T1 = TEXT/TIMES       $$ T1 = TEXT/'03/11/15 16:23:43'
T1 = TEXT/TIMES,1      $$ T1 = TEXT/'03/11/2015 16:23:43'
T1 = TEXT/TIMES,2      $$ T1 = TEXT/'03/11/15'
T1 = TEXT/TIMES,3      $$ T1 = TEXT/'16:23:43'
T1 = TEXT/TIMES,4      $$ T1 = TEXT/'03/11/2015'
T1 = TEXT/TIMES,10     $$ T1 = TEXT/'MAR/11/15 16:23:43'
T1 = TEXT/TIMES,11     $$ T1 = TEXT/'MAR/11/2015 16:23:43'
T1 = TEXT/TIMES,12     $$ T1 = TEXT/'MAR/11/15'
T1 = TEXT/TIMES,13     $$ T1 = TEXT/'16:23:43'
T1 = TEXT/TIMES,14     $$ T1 = TEXT/'MAR/11/2015'
```

3.4. POSTF(21) Improvement

To make FIL programming with **XX=POSTF(21)** easier, this command will now zero out the first twenty CLWRD locations in the FIL buffer to avoid reading an invalid value for a **VAR=POSTF(7,n)** when n is past the number of valid words.

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SPost V6.7 - What's New

3.5. TEXT/OMIT,ON-OFF

Add new options to the **TEXT/OMIT,…** command (**ON-OFF**). This command sets the flag to trim the leading blanks in all the following **TEXT/**scalars. By default, the conversion of a scalar to a text string will add one leading blank. Using the **T0=TEXT/OMIT,ON** command, you can trim the leading blank and not require a **T1=TEXT/OMIT,T1,2** command to remove it.

Example: The default is to have leading blank for **T1** when you convert the S1 scalar to a string.

```
S1=103
T1=TEXT/S1              $$ T1 WILL BE 4-CHAR LONG " 103"
T2=TEXT/OMIT,T1,1       $$ USE THE EXTRA CMD TO TRIM IT
```

Example: Usage of the new **T0=TEXT/OMIT,ON** option.

```
T0=TEXT/OMIT,ON         $$ SET FLAG REQUIRED ONLY ONCE

S1=103
T2=TEXT/S1              $$ T2 WILL BE 3-CHAR LONG "103"
```

Note: You have to specify **T0=TEXT/OMIT,ON** only once and it applies to all the subsequent **TEXT/**commands that are converting scalars. So you can place it once at the top of the FIL file after **REDEF/ON** or the header line. You need not specify **T0=TEXT/OMIT,OFF** as it is the default to support the legacy FIL files, or strings that need the leading blank.

3.6. FILEF Documentation

Added a note to the FIL manual about **XX=FILEF(n,21,t1)** for append write. When using this format, do not use the "Continuation Character" for **INSERT** in the Option file. Use one or the other but not both.

If the **XX=FILEF(n,21,t1)** command "append write" final text line exceeds 128 characters in length, it may be trimmed to 128 characters automatically and no warning is given by the post.

The **XX=POSTF(33)** function limited the text size to 16-chars instead of the normal 128-chars. This has been fixed.