SMARTSHOP III AUTO LOADER

[----] = HARD KEY (KEYS THAT DO NOT CHANGE)

(----) = SOFT KEY (KEYS THAT CHANGE ON SCREEN)

ALL PROCESSES START FROM MAIN SCREEN

HARD KEYS & MEANINGS

- [CYCLE START] – START PROCESS
- [S.B.K] – SINGLE BLOCK MODE
  - WHEN ACTIVE PROGRAM CAN BE RUN LINE BY LINE BY PRESSING [CYCLE START]
- [MPG SIM] – MPG SIMULATOR
  - WHEN ACTIVE PROGRAM CAN BE RUN LINE BY LINE USING THE MPG
- [AUTO] – AUTOMATIC MODE
  - WHEN ACTIVE MACHINE WILL BE ABLE TO RUN PROGRAMS
- [MDI] – MANUAL DATA INPUT
  - WHEN ACTIVE CAN MANUALLY INPUT MACRO CODES
- [MPG] – MANUAL PULSE GENERATOR
  - WHEN ACTIVE CAN BE USED TO JOG MACHINE USING HAND HELD CONTROLLER
- [HOME] – HOMING OF MACHINE
  - WHEN ACTIVE PRESSING ANY AXIS BUTTON WILL CAUSE MACHINE TO REFRENCE MACHINE ‘0’
- [JOG] – MANUAL JOGGING OF MACHINE
  - WHEN ACTIVE MACHING CAN BE MANUALLY JOGGED USING AXIS BUTTONS ON THE PANEL
- [RAPID JOG] – RAPIDLY JOGS MACHINE
  - WHILE BEING PRESSED WITH ANY AXIS BUTTON SURROUNDING IT THE MACHINE WILL RAPIDLY JOG THAT AXIS

- [LOCATE] – LOCATION PINS
  - WHEN ACTIVE PINS WILL POP UP TO EASILY ALIGN MATERIAL
    - **WHEN ACTIVE MACHINE WILL NOT ALLOW RUNNING OF PROGRAMS**

- [TOOL SET] – TOOL TOUCH OFF
  - WHEN ACTIVE AFTER PREFORMING A TOOL CHANGE BIT WILL AUTOMATICALLY TOUCH OFF TO REFRENCE PROPER HEIGHT OF BIT

- [F0/GOO] - [100%/G00] – RAPID OVERIDE KEYS
  - USING THESE KEYS WILL ALLOW YOU TO SLOW THE RAPID SPEED OF THE MACHINE FROM 0% 25% 50% OR 100%

- [-10%/G01] - [+10%/G01] -FEED RATE OVERIDE KEYS
  - USING THESE KEYS WILL ALLOW YOU TO SLOW OR SPEED UP THE FEED RATE OF THE MACHINE FROM 0% 20% 40% 60% 80% 100% 120% OR 150% OF THE ORIGINAL POSTED FEED RATE
    - **USING THESE BUTTONS MAY CAUSE HARM TO THE MACHINE, SPINDLE, MATERIAL, OR OPERATOR & SURROUNDING PERSONS**

- [VACUUM PUMP] – VACUUM PUMP BUTTERFLY VALVE
  - THIS BUTTON CONTROLS A BUTTERFLY VALVE ALLOWING IT TO BE OPENED OR CLOSED FOR HOLDING MATERIAL TO THE SPOIL BOARD

- [SP COVER] -DUSTHOOD
  - RASIES AND LOWERS SPINDLE DUSTHOOD

- [LOAD] – SUCTION CUPS
  - USED TO RASIE AND LOWER SUCTION CUPS

- [UNLOAD] – PUSHER BAR
  - USED TO RAISE AND LOWER PUSHER BAR

- [FEED HOLD] – PAUSE PROCESS
  - WHEN ACTIVE IT WILL HOLD THE CURRENT PROCESS IN PLACE UNTIL [CYCLE START] IS PRESSED TO RESUME

- [SP DEVICE] – SPINDLE
  - USED TO RAISE AND LOWER THE SPINDLE FOR USE OF DRILL BLOCK

- [CCW] – COUNTER CLOCKWISE
  - USED TO ROTATE THE TOOL CAROUSEL COUNTER CLOCKWISE

- [CW] – CLOCKWISE
    - USED TO ROTATE THE TOOL CAROUSEL CLOCKWISE

- [RESET] – RESET BUTTON (TOP RIGHT CORNER)
    - USED TO CLEAR ALARM OR CANCEL A PROCESS

- [F3] – HARD OVERTRAVEL OVERIDE
    - WHILE PRESSED YOU CAN JOG THE MACHINE OFF OF A HARD OVER TRAVEL ON ANY AXIS

- [F5] – TOOL CAROUSEL EXTEND/RETRACT
    - USED TO EXTEND AND RETRACT THE TOOL CAROUSEL MANUALLY

- [F1] – [F5] – SCREEN KEYS
    - THESE KEYS ARE USED TO SHUFFLE THROUGH THE SOFT KEYS ON SCREEN

PROCEDURES

- HOMING OF MACHINE
  - **THIS PROCESS IS USED TO REFERENEC THE AXIS TO MACHINE '0'**
  - **THIS PROCESS MUST BE PREFORMED EVERTIME THE MACHINE HAS BEEN TURNED OFF**

    - [HOME]
    - TO HOME ALL AT ONCE AND INDIVIDUAL AXIS
      - Z+
      - X-
      - Y-

- INPUTTING MDI COMMANDS
  - **THIS PROCESS IS USED TO INPUT COMMANDS TO MANUALLY SEND MACRO INFORMATION TO THE MACHINE**

  - (MONITOR) [F4]
  - [MDI]
  - (MDI INPUT) [F3]
  - INPUT M-CODE
  - (OK) [F1]
  - [CYCLE START]

- AUTOMATIC TOOL CHANGE
  - **THIS PROCESS IS USED TO AUTOMATICALLY CHANGE THE TOOLS IN THE SPINDLE**

  - (MONITOR) [F4]
  - [MDI]
  - (MDI INPUT) [F3]
  - T*
    - USE NUMBERS 1-8 DEPENDING ON WHAT TOOL IS REQUIRED
  - (OK) [F1]
  - [CYCLE START]

- AUTO TOUCHOFF
  - **THIS PROCESS IS USED TO AUTOMATICALLY SET THE TOOL LENGTH OF A BIT**

    - [TOOL SET]
    - FOLLOW STEPS FOR 'AUTOMATIC TOOL CHANGE' TO COMPLETE PROCESS

- CALL OUT FOR DRILLS
  - **THIS PROCESS IS USED TO CALL OUT INDIVIDUAL DRILL BITS**

    - (MONITOR) [F4]
    - [MDI]
    - (MDI INPUT) [F3]
    - T**00
      - USE NUMBERS 21-29 DEPENDING ON THE DRILL YOU WANT TO USE
    - (OK) [F1]
    - [CYCLE START]
      - **WITHOUT RETRACTING THE DRILLS, THEY WILL STAY DOWN CAUSING POSSIBLE COLLISION WITH MATERIAL AND BED WHILE SPINDLE IS IN USE**
      - **(FOLLOW STEPS FOR RETRACTING DRILLS TO ENSURE NO DAMAGE IS CAUSED)**

- RETRACTING DRILLS
  - **THIS PROCESS IS USED TO RETRACT THE DRILLS AFTER CALLING THEM OUT**

    - (MONITOR) [F4]
    - [MDI]
    - (MDI INPUT) [F3]
    - 'T00'
      - THIS CALL OUT WILL RETRACT ANY AND ALL DRILLS ON THE DRILL BLOCK
    - [CYCLE START]

- SETTING ORIGIN
  - **THIS PROCESS IS USED TO SET THE ORIGIN OF THE MACHINE FOR PROGRAMS**

    - (MONITOR) [F4]
    - [MDI]
    - (MDI INPUT) [F3]
    - 'T2500'
    - (OK) [F1]
    - [CYCLE START]
    - [MPG]
    - [SP. COVER]
    - MANUALLY JOG DRILL BLOCK TO LOWER LEFT CORNER OF SPOIL BOARD
    - [BACK ARROW] (X2)
    - (OFFSET/SETTING) [F3]
    - HIGHLIGHT X AXIS UNDER G54P1(G54)
    - (WORK PIECE COORDS) [F1]
    - (APPLY MACHINE COORDS) [F1]
    - (OK) [F1]
    - HIGHLIGHT Y AXIS UNDER G54P1(G54)
    - (APPLY MACHINE COORDS) [F1]
    - (OK) [F1]
    - [BACK ARROW] (X2)
    - [JOG]
    - RAISE Z AXIS
    - RETRACTING DRILL
      - (MONITOR) [F4]
      - [MDI]
      - (MDI INPUT) [F3]
      - 'T00'
      - (OK) [F1]
      - [CYCLE START]
    - [SP. DEVICE]
    - MAKES SPINDLE ACTIVE

- VERIFYING ORIGIN
  - **THIS PROCESS IS USED TO ENSURE ORIGIN HAS BEEN SET PROPERLY**

    - (MONITOR) [F4]
    - [MDI]
    - (MDI INPUT) [F3]
    - 'G54G0X0Y0'
    - (OK) [F1]
      - **MACHINE WILL RAIDLY MOVE TO ORIGIN BUT WILL NOT RAISE 'Z' AXIS**
      - **ENSURE THAT THE SPINDLE WILL NOT CRASH**
    - [CYCLE START]

- MANUAL TOUCHOFF
  - **THIS PROCESS IS USED TO MAUNALLY SET THE TOOL LENGTH OF A BIT**

    - TOOL CHANGE TO BIT
      - REFER TO AUTOMATIC TOOL CHANGE
      - ONCE TOOL CHANGE HAS BEEN COMPLETED MOVE TO NEXT STEP
    - [MPG]
    - TURN VACUUM(S) ON
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - MANUALLY JOG BIT TO TOP OF SPOIL BOARD
    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - HIGHLIGHT COORESPONDING TOOL # LENGTH GEOMETERY
    - (SET TOOL MACH COORD) [F2]
    - (OK) [F1]

- SETTING TOOL IN SPINDLE
  - **THIS PROCESS IS FOR MANUALLY SWAPPING THE BIT IN THE SPINDLE WITH A TOOL IN THE TOOL RACK WITHOUT PERFORMING THE TOOL CHANGE PROCESS**

    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - (TOOL NO.) [F4]
    - HIGHLIGHT 'SPINDLE NO'
    - INPUT CORRECT TOOL #
    - 'ENTER'

- LOADING A PROGRAM
  - **THIS PROCESS IS USED FOR LOADING PROGRAMS FROM A USB OR OTHER DEVICE**

    - (PROGRAM) [F2]
    - (FILE MANAGER) [F4]
    - (FILE TRANSFER) [F4]
    - (FILE IMPORT) [F1]
    - HIGHLIGHT FILE
    - (SELECT) [F2]
    - (COPY) [F1]
    - [BACK ARROW] (X2)
      - REFER TO 'SETTING MAIN PROGRAM' IF TRYING TO RUN A PROGRAM

- SETTING MAIN PROGRAM
  - **THIS PROCESS IS USED FOR SETTING THE MAIN PROGRAM OF THE MACHINE TO RUN**

    - (PROGRAM) [F2]
    - (FILE MANAGER) [F4]
    - HIGHLIGHT FILE
    - (EXECUTE) [F5]
      - SETS AS 'MAIN' PROGRAM
      - TAKES YOU TO (MONITOR) SCREEN
    - REFER TO STEP '5' OF 'RUNNING A PROGRAM' IF TRYING TO RUN A PROGRAM

- RUNNING A PROGRAM
  - **THIS PROCESS IS USED TO RUN THE DESIGNATED PROGRAM ON THE MACHINE**

    - (PROGRAM) [F2]
    - (FILE MANAGER) [F4]
    - HIGHLIGHT FILE
    - (EXECUTE) [F5]
      - MAKES IT 'MAIN' PROGRAM
      - TAKES YOU TO (MONITOR) SCREEN
    - [AUTO]
    - TURN VACUUM(S) ON
    - TURN DUST COLLECTOR ON
    - [CYCLE START]

- DELETE PROGRAM
  - **THIS PROCESS IS USED TO DELETE PROGRAMS FROM THE CNC MEMORY**

    - (PROGRAM) [F2]
    - (FILE MANAGER) [F4]
    - (DELETE FILE) [F3]
    - (SELECT) [F1]
      - SELECT FILES TO BE DELETED
      - MULTIPULE FILES CAN BE SELECTED
      - YOU CAN NOT DELETE THE 'MAIN' PROGRAM
    - (DELETE FILES) [F4]
    - (OK) [F1]

- ALARM SCREEN
  - **THIS PROCESS IS USED TO FIND ALARMS THE MACHINE HAS ENCURED**

    - (MAINTAIN) [F5]
    - (ALARM) [F1]
    - (PENDING ALARM) [F1]
      - SHOWS CURRENT ALARM THAT IS ACTIVE
    - (HISTORY ALARM) [F2]
      - SHOWS THE HISTORY OF EVERY ALARM THE MACHINE HAS RECORDED WITH DATES AND TIME
    - (SAVE ALARM) [F3]
      - ALLOWS YOU TO SAVE PENDING ALARMS TO EXTERNAL DEVICE

- MPG SIMULATOR
  - **THIS PROCESS IS USED TO MANUALLY RUN THE PROGRAM LINE BY LINE USING THE MPG**

    - SELECT JOB TO RUN
      - REFER TO RUN PROGRAM
    - TURN VACCUM(S) ON
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - [MPG SIMULATOR]
    - [AUTO]
    - [CYCLE START]
    - JOG MPG CLOCKWISE TO SIMULATE PROGRAM LINE BY LINE

- USING OPERATOR PANEL
  - **THIS PROCESS IS USED TO SETUP FILES TO BE RUN AND A CERTAIN AMOUNT OF TIMES**

    - (OPERATOR PANEL) [F1]
    - (FILE MANAGER) [F3]
    - USE ARROWS & 'ENTER' KEY TO SELECT FILE(S)
    - (OUTPUT LIST) [F1]
    - USING ARROW KEYS SCROLL TO 'REPEAT' ON EACH FILE TO ENTER THE NUMBER OF TIMES TO RUN
    - 'ENTER'
    - [AUTO]
    - TURN ON VACUUM(S)
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - TURN ON DUST COLLECTOR
    - [CYCLE START]

- AUTO LOAD MATERIAL
  - **THIS PROCESS IS USED TO AUTOMATICALLY LOAD AND UNLOAD MATERIAL ONTO THE CNC**

    - [MDI]
    - (MONITOR) [F4]
    - (MDI INPUT) [F3]
    - 'M405'
    - (OK) [F1]
    - ENSURE SCISSOR LIFT IS SET TO 'AUTO' AND MATERIAL IS AT PROPER HEIGHT AND ALIGNED CORRECTLY
    - TURN VACUUM(S) ON
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - [CYCLE START]
      - MACHINE WILL AUTOMATICALLY GO TO THE BACK TO PICK UP MATERIAL AND ALIGN IT FOR RUNNING A PROGRAM

- HOW TO RUN A FLYCUT
  - **THIS PROCESS IS USED TO FLATTEN THE SPOIL BOARD AND BE PERFECTLY FLAT TO THE SPINDLE**
  - **ALSO USED AFTER RUNNING THE MACHINE FOR SOME TIME AND HAVE MARKS LEFT IN THE BOARD CAUSING SMALLER PARTS TO MOVE**

    - (OFFSET/SETTING) [F3]
    - HIGHLIGHT Z UNDER EXTERNAL SHIFT
    - INPUT '0'
    - (BACK ARROW) (X2)
    - [MDI]
    - (MONITOR) [F4]
    - (MDI INPUT) [F3]
    - 'T*'
      - TOOL CHANGE TO YOUR FLYCUT BIT
    - (OK) [F1]
    - [CYCLE START]
    - [MAIN]
    - TURN ON VACUUM(S)
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - [SP. COVER]
    - [JOG]
      - USING THE JOG BUTTONS MOVE THE SPINDLE TO THE GENERAL AREA OF THE SPOIL BOARD MAINTANING 1' AWAY FROM ALL EDGES
    - [MPG]
      - USING THE HAND-HELD CONTROLLER MOVE THE BIT AS CLOSE TO THE TOP OF THE SPOIL BOARD
    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - HIGHLIGHT COORESPONDING TOOL 8 LENGTH GEOMETERY
    - (SET TOOL MACH COORD) [F2]
    - (OK) [F1]
    - FOLLOW STEPS FOR 'LOADING A PROGRAM' TO LOAD YOUR FLYCUT PROGRAM

- SETTING SPOIL BOARD HEIGHT
  - **THIS PROCESS IS USED TO SET THE DIFFERENCE IN HEIGHT BETWEEN THE TTO AND THE SPOILBOARD TO ENSURE PROPER CUTTING DEPTH**

    - [MAIN]
    - [AUTOTOOL]
    - [MDI]
    - (MONITOR) [F4]
    - (MDI INPUT) [F3]
      - TOOL CHANGE TO ENDMILL
      - OR ANY FLAT ENDED BIT
    - [MAIN]
    - TURN ON VACUUM(S)
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - [SP. COVER]
    - [JOG]
      - USING THE JOG BUTTONS MOVE THE SPINDLE TO THE GENERAL AREA OF THE SPOIL BOARD MAINTANING 1' AWAY FROM ALL EDGES
    - [MPG]
      - USING THE HAND-HELD CONTROLLER MOVE THE BIT AS CLOSE TO THE TOP OF THE SPOIL BOARD
    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - SUBTRACT CORRESPONDING TOOL 'LENGTH GEOMETERY' FROM 'MACHINE Z'
      - EXAMPLE
        - MACHINE Z VALUE: -264.020
        - TOOL LENGTH GEOMETERY: -281.486
        - (-264.020) – (-281.486) = 17.466
    - [BACK ARROW] (X2)
    - (OFFSET/SETTING) [F3]
    - HIGHLIGHT Z UNDER EXTERNAL SHIFT
    - INPUT THE VALUE FROM THE DIFFRENCE BETWEEN THE TOOL 'LENGTH GEOMETERY AND 'MACHINE Z' POSITION
      - SHOULD BE A POSITIVE VALUE
        - EX: 17.466
    - FOLLOW STEPS FOR 'VERIFYING SPOIL BOARD HEIGHT' TO ENSURE THE VALUE IS SET CORRECTLY

- VERIFYING SPOIL BOARD HEIGHT
  - **THIS PROCESS IS USED TO ENSURE THAT THE SPOILBOARD HEIGHT HAS BEEN SET CORRECTLY**

    - [TOOL SET]
    - [MDI]
    - (MONITOR) [F4]
    - (MDI INPUT) [F3]
    - 'T*'
      - MAKE SURE TO USE A FLAT END MILL BIT
    - [CYCLE START]
      - SHOULD PROCEED TO TOUCH OFF THE BIT
    - [MAIN]
    - TURN ON VACUUM(S)
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - [SP. COVER]
    - [JOG]
      - USING THE JOG BUTTONS MOVE THE SPINDLE TO THE GENERAL AREA OF THE SPOIL BOARD MANITAINING 1' AWAY FROM ALL EDGES
    - [MPG]
      - USING THE HAND-HELD CONTROLLER MOVE THE BIT TO THE TOP OF THE SPOIL BOARD UNTILL YOU ARE TOUCHING
    - (BACK ARROW) (X2)
    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - VERIFY CORRESPONDING TOOL 'LENGTH GEOMETERY' & 'ABSOLUTE Z' ARE RELATIVELY CLOSE TO THE SAME VALUE
      - WITH IN A FEW DECIMAL VALUES OF EACH OTHER

PARAMETERS

ALL PARAMETERS ARE IN MM

- PARAMETERS PAGE
    - [RIGHT ARROW] (X1)
    - (PARAM) [F3]
    - (GOTO PARAM) [F5]
    - INPUT PARAMETER #
    - (OK) [F1]
    - NO DECIMAL FOR ANY PARAMETERS
        - ALL PARAMETERS ARE IN MM
        - ALL PARAMETERS MUST BE CARRIED OUT TO THE 3RD DECIMAL (.000)
        - EXAMPLE
            - '123.4' SHOULD BE TYPED '123400' INTO THE PARAMETER SCREEN
- AMOUNT OF TOOLS
    - 3409 – NUMBER OF TOOLS THE MACHINE CAN HOLD
        - TOOL CAROSUEL ONLY
- LOAD POSITION
    - 3430 – THE START OF AUTOMATIC LOADING
    - 3427 – THE START OF PUSH
    - 3428 – THE END OF PUSH (60000)
    - 3429 – SPEED OF PUSH (10000)
- DRILL BLOCK OFFSET
    - 3441 – X AXIS OFFSET DISTANCE FROM DRILL BLOCK TO SPINDLE
    - 3442 – Y AXIS OFFSET DISTANCE FROM DRILL BLOCK TO SPINDLE
- MAX CUTTING FEEDS
    - 621 – X AXIS (600 IPM) (15240 MM)
    - 622 – Y AXIS (600 IPM) (15240 MM)
    - 623 – Z AXIS (125 IPM) (3175 MM)
- RAPIDS
    - 461 – X (800 IPM) (20320 MM)
    - 462 – Y (800 IPM) (20320 MM)
    - 463 – Z (150 IPM) (3810 MM)

- Z-SWITCH
    - 3411 – DIFFRENCE IN HEIGHT BETWEEN THE TTO AND SPOIL BOARD
- MAX SPINDLE RPM
    - 3460 – (24000 RPM)
- CONVERT UNITS OF MEASUREMENT
    - (MAINTAIN)
    - (SYSTEM SETTINGS)
    - ‘0’ = MM
    - ‘1’ = INCHES

- TTO LOCATION
    - 2841 – X LOCATION
    - 2842 – Y LOCATION
    - 2843 – LOWEST POSTION OF Z AXIS FOR TTO
    - 2844 – DISTANCE THE MACHINE TRAVELS TO AT A RAPID SPEED FOR TTO
        - SETTING LOCATION MUST BE DONE WITH DRILL BLOCK ‘T2500’
            - (MONITOR) [F4]
            - [MDI]
            - (MDI INPUT) [F3]
            - ‘T2500’
            - (OK) [F1]
            - [CYCLE START]
            - [MPG]
            - MANUALLY JOG DRILL BLOCK OVER THE CENTER OF THE TTO
            - WRITE DOWN THE ‘MACHINE X’ COORDINATES
            - WRITE DOWN THE ‘MACHINE Y’ COORDINATES
            - (MONITOR) [F4]
            - [MDI]
            - (MDI INPUT) [F3]
            - ‘T00’
            - (OK) [F1]
            - [CYCLE START]
                - THIS WILL RETRACT DRILL ‘T2500’
            - [BACK ARROW] (X2)
            - [RIGHT ARROW] (X1)
            - (PARAM) [F3]
            - (GOTO PARAM) [F5]
            - ‘2841’
                - INPUT ‘MACHINE X’ COORDINATE
            - ‘2841’
                - INPUT ‘MACHINE Y’ COORDINATE

- SETTING TTO HEIGHT
  - **THIS PROCESS IS USED TO SET THE PROPER HEIGHT OF THE TOOL TOUCH OFF TO THE BLACK PHENOLIC**

    - (OFFSET/SETTING) [F3]
    - HIGHLIGHT Z UNDER EXTERNAL SHIFT
    - '0'
    - (PARAMETERES)
    - (GOTO) [F5]
    - '3411'
    - (OK) [F1]
    - '0'
    - ENTER PASSWORD
    - (OK) [F1]
    - [TOOL SET]
    - (MONITOR) [F4]
    - [MDI]
    - (MDI INPUT) [F3]
    - T*
      - TOOL CHANGE TO ENDMILL
      - OR ANY FLAT ENDED BIT
    - (OK) [F1]
    - [CYCLE START]
      - SHOULD PROCEED TO TOUCH OFF THE BIT
    - TURN VACUUM(S) ON
      - MAKE SURE VACUUM PUMP LIGHT IS ON
    - [SP. COVER]
    - [JOG]
      - USING THE JOG BUTTONS MOVE THE SPINDLE TO THE GENERAL AREA OF THE PHENOLIC
    - [MPG]
      - USING THE HAND-HELD CONTROLLER MOVE THE BIT TO THE TOP OF THE PHENOLIC UNTILL YOU ARE TOUCHING
    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - SUBTRACT CORRESPONDING TOOL 'LENGTH GEOMETERY' FROM 'MACHINE Z'
      - EXAMPLE
      - MACHINE Z VALUE: -264.020
      - TOOL LENGTH GEOMETERY: -281.486
      - (-264.020) – (-281.486) = 17.466
    - (PARAMETERES)
    - '3411'
    - (GOTO) [F5]
    - INPUT THE VALUE FROM THE EQUATION ABOVE
      - 17.466
      - FOLLOW STEPS FOR 'VERIFYING TTO HEIGHT' TO ENSURE HEIGHT IS SET PROPERLY

- VERIFYING TTO HEIGHT
  - **<u>THIS PROCESS IS USED TO ENSURE THAT THE TOOL TOUCH OFF HEIGHT HAS BEEN SET CORRECTLY</u>**

    - [TOOL SET]
    - [MDI]
    - (MONITOR) [F4]
    - (MDI INPUT) [F3]
    - 'T*'
      - TOOL CHANGE TO ENDMILL
      - OR ANY FLAT ENDED BIT
    - [CYCLE START]
      - SHOULD PROCEED TO TOUCH OFF THE BIT
    - [SP. COVER]
    - [JOG]
      - USING THE JOG BUTTONS MOVE THE SPINDLE TO THE GENERAL AREA OF THE PHENILOC
    - [MPG]
      - USING THE HAND-HELD CONTROLLER MOVE THE BIT TO THE TOP OF THE PHENOLIC UNTILL YOU ARE TOUCHING
    - (BACK ARROW) (X2)
    - (OFFSET/SETTING) [F3]
    - (TOOL SET) [F2]
    - VERIFY CORRESPONDING TOOL 'LENGTH GEOMETERY' & 'ABSOLUTE Z' ARE RELATIVELY CLOSE TO THE SAME VALUE
      - WITH IN A FEW DECIMAL VALUES OF EACH OTHER

- TOOL CHANGE LOCATION
  - **<u>THIS PROCESS IS USED TO ENSURE THE TOOL CHANGE LOCATION IS SET PROPERLY</u>**

    - 2801 – X AXIS LOCATION
    - 2803 – Z AXIS LOCATION
    - 2821 – POSTION OF X AXIS AFTER TOOL CHANGE
    - 2823 – POSITION OF Z AXIS AFTER RELEASE OF TOOL
      - SETTING TOOL CHANGE LOCATION MUST BE DONE WITH [SP DEVICE] LIGHT ON
        - [MPG]
        - [F5]
          - TOOL CAROSUEL EXTEND/RETRACT
        - JOG SPINDLE OVER TO TOOL CAROSUEL & ALIGN THE TOOL CONE WITH THE TOOL CLIP ALONG THE X & Z AXIS
        - WRITE DOWN THE ‘MACHINE X’ COORDINATES
        - WRITE DOWN THE ‘MACHINE Z’ COORDINATES
        - [RIGHT ARROW] (X1)
        - (PARAM) [F3]
        - (GOTO PARAM) [F5]
        - ‘2801’
          - INPUT ‘MACHINE X’ COORDINATES
        - ‘2803’
          - INPUT ‘MACHINE Z’ COORDINATES

NOTES