

PROGRAM BAS

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'-----HEADER.DAT-----
'----- Parameter Values Header -----
'set RPPMAX for cam for x mill
PARAMS START
'STIFF PARAMETERS
' POLECOUNT = 4
' ILC = 194
' SIX.THRESH = 4000.000000
' SIG.THRESH = 3600.000000
' KVP = 0.519846
' KVI = 16.666667
' ARF0 = 350.000000
' ARF1 = 12000000.000000
' KPP = 50.000000
' BLKTYPE = 2
' ILMT.PLUS = 100
' ILMT.MINUS = 100
' DACMAP = 0
' DMGAIN = 1.000000
' CMDGAIN = 1.000000
' ITF0 = 0.020000
' IT.THRESH = 60
' KVFF = 0.000000
' ADF0 = 1000.000000
' AD.OFFSET = 0.000000
' DMF0 = 1000.000000
' COMMOFF = 0.000000

'MEDIUM PARAMETERS
POLECOUNT = 4
  ILC = 194
  SIX.THRESH = 4000.000000
  SIG.THRESH = 3600.000000
  KVP = .5      'KVP = 0.155954
  KVI = 5.000000
  ARF0 = 150.000000
  ARF1 = 750.000000
  KPP = 15.000000
  BLKTYPE = 2
  ILMT.PLUS = 100
  ILMT.MINUS = 100
  DACMAP = 0
  DMGAIN = 1.000000
  CMDGAIN = 1.000000
  ITF0 = 0.020000
  IT.THRESH = 60
  KVFF = 0.000000
  ADF0 = 1000.000000
  AD.OFFSET = 0.000000
  DMF0 = 1000.000000
  COMMOFF = 0.000000

PARAMS END
'----- Variable Definitions -----
' for help put cursor on -> DIM <- and hit <F1> key

DIM MUST_HOME AS INTEGER
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                                PROGRAM BAS
DIM CYCLE_STOP AS INTEGER      '1 IF CYCLE STOP
DIM SAVE_XMILL_ON_OFF AS INTEGER 'USED IN MOTORS ON/OFF ROUTINE
DIM SAVE_CAM_SPEED AS FLOAT    'SAVE ANALOG.OUT HERE
DIM STOP_SPINDLE AS INTEGER
DIM SAVE_SPINDLE_SPEED AS FLOAT
DIM RPM AS FLOAT
DIM RPMAX AS FLOAT
'----- Main Program -----
CONST HOME_SPEED = .5 'CAM SHAFT HOME SPEED
CONST SPINDLE_HOME_VEL = 500
CONST INDEX_SPEED = 1000
CONST CW = 0
CONST CCW = 1
AUTOSTART = 1
'RPMAX = 40.0 'for cam shaft
RPMAX = 7500 'for r22 and SC402-001-T1 cross mill option 7500rpm at motor
              '10000 at spindle, gear ratio 16/12
'-----STOP CAM SHAFT AND SPINDLE
ANALOG.OUT = 0      'STOP CAM SHAFT
ABORT.MOTION        'STOP SPINDLE
SAVE_XMILL_ON_OFF = 0
'-----TURN ON THE "MUST HOME MACHINE" INDICATOR
OUT1 = 0

'-----TURN ALL AUX. OUTPUTS OFF
OUT5 = 0: OUT7 = 1: OUT8 = 1: OUT9 = 1: OUT10 = 1

'IN.POS.LIMIT = 100 FOR AUGAT AND 20 FOR FUTURISTICS
IN.POS.LIMIT = 100
ENABLE = 1
ACCEL.TYPE = 0
ACCEL.RATE = 20000
DIR = CW      '0 FOR CW, 1 FOR CCW
DECEL.RATE = 20000
RUN.SPEED = 0
CYCLE_STOP = 1
INTR.I5LO = 1 'ENABLE E STOP INTERRUPT

'-----WAIT FOR HOME SWITCH, PULSE THE MUST HOME LIGHT
BLINK_HOME:
PRINT "WAITING FOR HOME SWITCH"
PAUSE.TIME = .5 : PAUSE
OUT1 = 0
PAUSE
OUT1 = 1
IF INP1 = 1 THEN
GOTO BLINK_HOME
END IF

'-----TURN "HOME MACHINE" INDICATOR ON SOLID
OUT1 = 0;

'-----HOME THE CAM SHAFT
PRINT "HOMING THE CAM SHAFT"
REG.MODE = 1 'GRAB ENCODER POSITION ON INDEX PULSE
REG.FLAG = 0
PAUSE.TIME = 1
PAUSE

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ANALOG.OUT = HOME_SPEED
PAUSE
'WHEN REG.FLAG, CONTINUE
WHILE REG.FLAG = 0 : WEND
ANALOG.OUT = 0      'STOP CAM SHAFT
PAUSE.TIME = 2 : PAUSE 'WAIT FOR CAM SHAFT TO STOP
ENCPOS = ENCPOS - REG.ENCPOS 'SET POSITION TO ZERO PLUS DISTANCE TO STOP
PRINT "CAM HOMED"

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'-----HOME THE SPINDLE
PRINT "HOMING THE SPINDLE"
RUN.SPEED = SPINDLE_HOME_VEL
REG.FLAG = 0
INDEX.DIST = 0- RESPOS
GO.INCR
WHILE IN.POSITION = 0
  PRINT RESPOS
WEND
OUT1 = 1      'TURN OFF HOME LIGHT
PRINT "SPINDLE HOMED"

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'-----BLINK RUN LIGHT WHILE WAITING FOR RUN SWITCH
INTR.I2LO = 1 'RUN SWITCH INTERRUPT
WHILE INP2 = 1
  PRINT "WAITING FOR RUN SWITCH"
  PAUSE.TIME = .5 : PAUSE
  OUT2 = 0
  PAUSE
  OUT2 = 1
WEND

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'-----WHEN RUN SWITCH IS PRESSED, TURN RUN LIGHT ON SOLID AND CONTINUE
PRINT "RUN SWITCH PRESSED"
OUT2 = 0
CYCLE_STOP = 0
WHEN INP4 = 1, CONTINUE 'WAIT FOR MOTORS ON SWITCH IF OFF

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'-----TURN ON OIL PUMP
PRINT "OIL PUMP ON"
OUT7 = 0
INTR.I3LO = 1 'ENABLE CYCLE STOP INTERRUPT
INTR.I4LO = 1 'ENABLE MOTORS ON/OFF INTERRUPT
INTR.FAULT = 1 'ENABLE FAULT ROUTINE
INTR.I14LO = 1 'ENABLE SC723 FAULT INTERRUPT

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'-----PART PROGRAM STARTS HERE
LOOP_START:
PRINT "PART PROGRAM START"
WHEN ENCPOS > 55 , CONTINUE
DIR = 0
STOP_SPINDLE = 0
RUN.SPEED = 1500
SAVE_SPINDLE_SPEED = 1500
GO.VEL
WHEN ENCPOS > 222 , CONTINUE
INTR.I4LO = 0
STOP_SPINDLE = 1
ABORT.MOTION

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WHILE IN.POSITION = 0
PRINT "SPINDLE STOPPING"
WEND
PRINT "SPINDLE STOPPED"
RUN.SPEED = 0
INTR.I4LO = 1
'-----INTR.DAT -----
'copy intr.cam to intr.dat if cam is controlled by analog out
'copy intr.xml to intr.dat if x mill is controlled by analog out
REG.FLAG = 0
WHILE REG.FLAG = 0 : WEND 'WAIT FOR CAM INDEX PULSE
ENCPOS = 0
IF CYCLE_STOP = 1 THEN
  OUT2 = 1          'RUN LIGHT OFF
  OUT3 = 0          'CYCLE STOP LIGHT ON
  OUT7 = 1          'STOP CAM MOTOR AND OIL PUMP
  SAVE_CAM_SPEED = ANALOG.OUT
  PAUSE.TIME = 2
  PAUSE
  ABORT.MOTION      'STOP SPINDLE
  PAUSE.TIME = 1
  PAUSE
  ANALOG.OUT = 0     'STOP X MILL
  WHEN INP4 = 1,CONTINUE 'WAIT HERE TILL MOTORS ON AGAIN
  WHEN INP3 = 1,CONTINUE 'WAIT FOR NO STOCK SWITCH TO RESET
  WHEN INP2 = 0,CONTINUE 'WAIT FOR RUN SWITCH
  CYCLE_STOP = 0
  OUT3 = 1          'CYCLE STOP LIGHT OFF
  OUT2 = 0          'RUN LIGHT ON
  PAUSE.TIME = 1
  PAUSE
  ANALOG.OUT = SAVE_CAM_SPEED 'TURN ON X MILL
  PAUSE
  GO.VEL            'START SPINDLE
  PAUSE.TIME = 1
  PAUSE
  OUT7 = 0          'START CAM MOTOR
END IF
GOTO LOOP_START
END
'-----PROGRAM END

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'-----SUBROUTINES-----
SUB CHECKIT
PRINT "MOTORS OFF"
OUT2 = 1          'RUN LIGHT OFF
SAVE_CAM_SPEED = ANALOG.OUT
OUT7 = 1          'STOP CAM SHAFT
PAUSE.TIME = 2
PAUSE
ABORT.MOTION      'STOP SPINDLE
SAVE_XMILL_ON_OFF = OUT5 'SAVE CROSS MILL STATUS
PAUSE.TIME = 1
PAUSE
ANALOG.OUT = 0     'STOP X MILL
WHILE INP4 = 0 'WAIT HERE TILL MOTORS ON AGAIN
PRINT "WAITING FOR MOTORS ON"
PAUSE.TIME = 1
OUT3 = 0          'BLINK CYCLE STOP LED

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PAUSE
OUT3 = 1
PAUSE
WEND
OUT3 = 1
WHILE INP2 = 1      'WAIT FOR RUN SWITCH
PRINT "WAITING FOR RUN"
PAUSE.TIME = 1
OUT2 = 0           'BLINK RUN LED
PAUSE
OUT2 = 1
PAUSE
WEND
OUT2 = 0           'RUN LIGHT ON
CYCLE_STOP = 0
PAUSE.TIME = 1
PAUSE
PRINT "RESTORE XMILL STATE"
ANALOG.OUT = SAVE_CAM_SPEED
PAUSE
IF STOP_SPINDLE = 0 THEN
PRINT "START SPINDLE"
RUN.SPEED = SAVE_SPINDLE_SPEED
GO.VEL      'START SPINDLE
END IF
PAUSE
PRINT "START CAM SHAFT AND OIL PUMP"
OUT7 = 0      'TURN ON OIL PUMP

PRINT "MOTORS ON COMPLETE"
END SUB

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'-----INTERRUPTS-----
'--RUN SWITCH INTERRUPT
INTERRUPT I2LO
PRINT "RUN SWITCH INTERRUPT"
INTR.I5LO = 1 'ENABLE E.STOP INTERRUPT
OUT3 = 1      'CYCLE STOP LED OFF
CYCLE_STOP = 0
INTR.I4LO = 1 'ENABLE MOTORS OFF INTERRUPT
INTR.I2LO = 1
END INTERRUPT

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'--CYCLE STOP INTERRUPT
INTERRUPT I3LO
CYCLE_STOP = 1
PRINT "CYCLE STOP"
OUT2 = 1      'RUN LIGHT OFF
OUT3 = 0      'CYCLE STOP LIGHT ON
INTR.I3LO = 1 'RE ENABLE INTERRUPT
END INTERRUPT

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'--MOTORS OFF INTERRUPT
INTERRUPT I4LO
PRINT "MOTORS OFF"
OUT2 = 1      'RUN LIGHT OFF

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                                PROGRAM BAS
OUT7 = 1          'OIL PUMP AND CAM OFF
PAUSE.TIME = 2
PAUSE
ABORT.MOTION      'STOP SPINDLE
SAVE_XMILL_ON_OFF = OUT5 'SAVE CROSS MILL STATUS
SAVE_CAM_SPEED = ANALOG.OUT
ANALOG.OUT = 0    'STOP CAM SHAFT
WHILE INP4 = 0    'WAIT HERE TILL MOTORS ON AGAIN
PRINT "WAITING FOR MOTORS ON"
PAUSE.TIME = 1
OUT3 = 0          'BLINK CYCLE STOP LED
PAUSE
OUT3 = 1
PAUSE
WEND
OUT3 = 1
WHILE INP2 = 1    'WAIT FOR RUN SWITCH
PRINT "WAITING FOR RUN"
PAUSE.TIME = 1
OUT2 = 0          'BLINK RUN LED
PAUSE
OUT2 = 1
PAUSE
WEND
OUT2 = 0          'RUN LIGHT ON
CYCLE_STOP = 0
PAUSE.TIME = 1
PAUSE
PRINT "RESTORE XMILL STATE"
ANALOG.OUT = SAVE_CAM_SPEED 'SAVE X MILL SPEED
PAUSE
IF STOP_SPINDLE = 0 THEN
PRINT "START SPINDLE"
RUN.SPEED = SAVE_SPINDLE_SPEED
GO.VEL      'START SPINDLE
END IF
PAUSE
PRINT "START CAM SHAFT"
OUT7 = 0      'TURN ON OIL PUMP AND CAM SHAFT
PRINT "MOTORS ON COMPLETE"
'INTR.I4LO = 1 'RE ENABLE INTERRUPT
END INTERRUPT

'--E.STOP INTERRUPT
INTERRUPT I5LO
PRINT "E. STOP ON"
OUT7 = 1      'OIL PUMP AND CAM OFF
OUT2 = 1      'RUN LIGHT OFF
CYCLE_STOP = 1
SAVE_CAM_SPEED = ANALOG.OUT
ANALOG.OUT = 0 'STOP X MILL
ABORT.MOTION  'STOP SPINDLE
SAVE_XMILL_ON_OFF = OUT5 'SAVE CROSS MILL STATUS

RESTART
END INTERRUPT

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'--753 FAULT INTERRUPT

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INTERRUPT FAULT
OUT2 = 1      'RUN LIGHT OFF
ANALOG.OUT = 0    'STOP CAM SHAFT
PAUSE.TIME = 2
PAUSE
ABORT.MOTION    'STOP SPINDLE
SAVE_XMILL_ON_OFF = OUT5 'SAVE CROSS MILL STATUS
OUT7 = 1        'OIL PUMP OFF
OUT5 = 0        'STOP X MILL
PRINT "SC753 FAULT"
INTR.FAULT = 1    'RE ENABLE INTERRUPT
END INTERRUPT
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'--723 FAULT INTERRUPT

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INTERRUPT I14LO
OUT2 = 1      'RUN LIGHT OFF
ANALOG.OUT = 0    'STOP CAM SHAFT
PAUSE.TIME = 2
PAUSE
ABORT.MOTION    'STOP SPINDLE
SAVE_XMILL_ON_OFF = OUT5 'SAVE CROSS MILL STATUS
OUT7 = 1        'OIL PUMP OFF
OUT5 = 0        'STOP X MILL
PRINT "SC723 FAULT"
INTR.I14LO = 1    'RE ENABLE INTERRUPT
END INTERRUPT
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'-----