Section 4: Run Mode

Auto, Running a Program

The AU command will only execute the currently active program. To select a program, different than the current program, use the PR command. See "PROGRAM LIBRARY".

1) To run the currently active program press the AUTO button.

    a. The control will prompt the operator to press the AUTO button again, or press MU for the run time menu (see RUN TIME MENU). Press the AUTO button again and wait for the WAITING message to appear on the screen.

    b. After pressing the auto button for the second time, the control begins to process the program. Press the START button at any time to interrupt the processing.

2) When the WAITING - message appears press the START button to execute the program.

    a. Inspect the feed rate and spindle potentiometers.

FORMAT 1 The machine will return to the home position; the original SET(axis) position, prior to execution of the program. The control will start with the default codes in effect before reading the currently active program.

FORMAT 2 The machine will begin execution of the program from the current location. The codes and offsets which were modal prior to pressing the AUTO button will remain in effect until canceled by the program.

3) If the program ends with the code, M2 or M30, the operator can run the program over again at the completion of the program by pressing the START button when the WAITING - message appears.

Note: See SINGLE STEP and MANUAL PULSE DRY RUN. In the AUTO mode the feed rate potentiometer controls only the programmed feed rate moves.

Waiting

The waiting stage gives the operator an opportunity to continue or abort any automatic motion by the machine before it occurs.

The control is in the waiting stage when the message "WAITING-" is flashing in the upper left portion of the screen, just below the position read-out (See Figure 4-1).

1) Press the START button to continue the automatic motion.

2) Press the MANUAL button to abort the automatic motion.
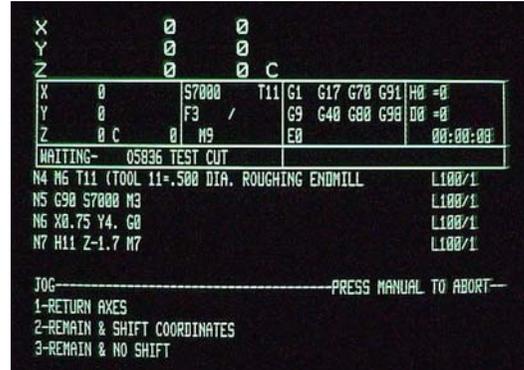
Figure 4-1 The control in waiting mode.

Below is a list of places where the waiting message appears before continuing with automatic motion.

a. After entering a yes (Y) to the move to home question.
b. After entering the HO command.
c. After the AUTO button is pressed.
d. After entering the first line of program coding in the Manual Data Input mode.
e. While executing the program at a line with a G4 P66000 coded. The G4 P66000 is a dwell coded for one minute and six seconds which immediately puts the control into the waiting stage.
f. While executing the program at a line with an M0 coded.
g. While executing the program at a line with an M1 coded, when the OPTIONAL STOP switch is in the upward position.
h. While executing the program at the line with an M2 coded. The program is ready to run from the beginning again, at this point.

Changing Modes

The control works in inches or metric depending on the mode set at power on. The default mode (condition at power on) is inches. This parameter may be changed using the SETP command. (See DEFAULT PARAMETERS, USING THE SETP COMMAND).

1) To establish the metric mode.

a. From the command mode type SETME then press the ENTER button.
b. In the first line of the program, use the code G71 to verify that the metric mode has been used. Use of this code is not essential for running the program in the metric mode. It is only for verification. A message

instructing the operator to use the SETME command will appear, if this mode has not been established.

Note: When jogging in the metric mode .01 in.=.254 mm, .001 in.=.0254 mm, .0001 in.=.00254 mm. The minimal move in the metric mode is .00254 mm (even though the positioning read-out displays three places after the decimal). Using .0001 increments the screen will read: .002, then .005, then .007, then .01 and so fourth.

2) To establish the *inches* mode.

 a. From the command mode type SETIN then press the ENTER button.
 b. In the first line of the program, use the code G70 to verify that the inches mode has been used. Use of this code is not essential for running the program in the inches mode. It is only for verification. A message instructing the operator to use the SETIN command will appear, if this mode has not been established.

Manual Pulse Dry Run

The Manual Pulse Dry Run Mode is accessible from the Auto Mode or any time the WAITING or SLIDE HOLD messages appear on the screen.

1) Press the AUTO button to enter the auto mode.

2) Rotate the MPG hand wheel to the right in the positive direction, the operator will be prompted by the message "PRESS START TO ACTIVATE MPD OR MANUAL TO SKIP". Pressing the START button will cause the machine to enter the MPD Dry Run mode.

 a. The more the hand wheel is turned the further the program is executed.
 b. At this point in time if the hand wheel is rotated to the left in the negative direction, this will cause the machine to move backward in linear moves only. Forward motion in circles is allowed, but not backward.
 c. The rate of execution is determined by two factors.
 • By the rate of hand wheel rotation.
 • By the feed rate used in the program. The higher the feed rate the faster the machine will move through the moves.

3) All moves require rotation of the hand wheel. This includes all the moves for the tool change.

4) When the hand wheel is not being rotated, the machine will enter the slide hold mode.

5) To exit this mode, press the START button or the AUTO button when the slide hold message is flashing. Doing this will start continuous automatic execution of the program.

6) To reenter this mode, rotate the hand wheel in the positive direction when the single step or the slide hold message is flashing, then press the start button.

Dry Run

The Dry Run procedure is used to prove (debug) the program. This procedure is usually performed by the programmer because changes to the program are usually made during the Dry Run procedure. It is referred to as the "Dry Run" because the material is not cut. This is called, "cutting air."

(See also RUN TIME MENU for Dry Run modes.)

1) Remove the part from the fixture.

2) Place all clamps in their approximate location and tighten to prevent movement.

3) While using Dry Run it is recommended that the SINGLE STEP mode be used.(See SINGLE STEP).

4) From the command mode type AU,,,3 then press the ENTER button. After pressing the ENTER button press the SINGLE STEP button.

The auto (AU) command AU,,,3 will run the program from the beginning to the end using Dry Run mode option number three. Dry Run option three will run the program and disregard the programmed feed rates. The program will run all feed rate moves at 75 IMP and all rapid moves at 300 IPM. In the single step mode, the feed rate potentiometer will control all feed rate moves and rapid moves. Use the feed rate potentiometer to slow the moves down if necessary. Also use the SLIDE HOLD button when needed.

(See also SLIDE HOLD, SLIDE HOLD, JOG AWAY FROM, and SINGLE STEP, JOG AWAY FROM)

Note: The Dry Run mode can be used in combination with a mid-tape (program) start. (See also MID-TAPE (PROGRAM) START)

EXAMPLE: AU,120,,3   This will use dry run option three and mid-tape start option zero.

AU,120,,3,1   This will use dry run option three and mid-tape start option one. (direct block start).

Single Step   The program can be executed one line (or block) at a time, using the SINGLE STEP and the START button.

After the AUTO button or the auto (AU) command is used, to execute the program, the AUTO and the START buttons function similarly. It is only after the SINGLE STEP button is pressed that the START button functions differently than the AUTO button. After the SINGLE STEP button is pressed, every time the START button is pressed the next line in the program is executed.

1) Press the AUTO button to get into the Auto mode.

2) Press the SINGLE STEP button to get into the single step mode.

3) Press the START button to execute the next line in the program.

When then SINGLE STEP button is pressed before the "WAITING -" message appears, the "SINGLE STEP -" message appears. The SINGLE STEP button can be pressed in the waiting stage and the next time the START button is pressed the "SINGLE STEP -" message appears, indicating to the operator the control is in the single step mode.

Note: In the single step mode the feed rate potentiometer has control of the programmed feed rate moves as well as the rapid moves. When in the auto mode the feed rate potentiometer controls only programmed feed rate moves. When the feed rate potentiometer is turned to zero, all machine motion stops, until it is turned up, then motion resumes.

Note: From the single step mode, press the AUTO button to discontinue the SINGLE STEP mode.

Note: From the single step mode, press the MANUAL button to return to the command mode.

Slide Hold

Tool motion can be stopped by using the SLIDE HOLD button. When this button is pressed, the control keeps the tool in the position where the tool is located, until the START button is pressed, at which time the remainder of the programmed move is made.

1) During programmed moves (in MDI mode or AUTO mode) press the SLIDE HOLD button.

The slide hold mode can be recognized be the message "SLIDE HOLD-" flashing in the lower left hand portion of the position display.

2) Press the START button to get out of the slide hold mode and complete the move.

3) When in the slide hold mode, the MANUAL button can be pressed to go into the command mode.

Note: If there is time, use the SLIDE HOLD button before using the EMERGENCY STOP button. The table may coast, when the EMERGENCY STOP button is used, but it will stop immediately when the SLIDE HOLD button is used. To stop the spindle when the SLIDE HOLD button is pressed, press the SPINDLE ON/OFF button.

(See also SLIDE HOLD, JOG AWAY FROM)

(See also SPINDLE, USING THE SPINDLE ON/OFF BUTTON)

Note: When the START button is pressed after the SLIDE HOLD button, the feed rate pot will control the remainder of the current move even if it is in rapid. The next program move will continue at either rapid or feed rate, whichever is programmed.

Mid-Tape (Program) Start

Using the mid-tape start option of the auto command (AU,FROM,TO,DRY RUN OPTION,MID-TAPE START OPTION), the program can be started from any block. The options available are explained below.

(See also PA (page) command)

Option 0: When this option is used, the control will process the program up to the block specified by the first parameter, and start the search for vital programming information from line N0.001. This will result in the machine moving to the previous X, Y, Z A and/or B position specified in the program. The axis will move in the order the program was written. If the program specified the spindle on, coolant on, tool length and/or fixture offset applied,

and cutter radius compensation applied, these will all be in effect when the automatic cycle begins. Likewise if any other vital information has been programmed.

EXAMPLE: To use Option 0 type AU,#,,,0 then press the ENTER button (where # is the block number to begin execution).

AU,50 <ENTER> Search starts from the beginning, and execution starts at N50.

Execution of the program will not begin until the message "WAITING -" appears on the screen, and the START or AUTO button is pressed. If the SINGLE STEP button is pressed before the message "WAITING" appears, the message "SINGLE STEP" will appear on the screen and the operator can single step the program by pressing the START button for each step. (See SINGLE STEP)

Note: Use SINGLE STEP for the first few moves so that the feed pot can be used to effect the rapid moves until the single step mode is canceled.

Option 1: When this option is used, the control will jump directly to the block specified by the first parameter, and prepare to begin execution at that block number. This is a Direct Block Start. All CNC coding necessary to run the subsequent blocks must be present at or after the specified first block to begin execution at.

EXAMPLE: To use Option 1, from the command mode type AU,#,,,1 then press the ENTER button (where # is the block number to begin execution).

AU,50, , ,1 <ENTER> Execution starts at N50. Direct Block Start

Execution of the program will not begin until the message "WAITING -" appears on the screen, and the START or AUTO button is pressed. If the SINGLE STEP button is pressed before the message "WAITING' appears, the message "SINGLE STEP" will appear on the screen and the operator can single step the program by pressing the START button for each step. (See SINGLE STEP)

Note: Use SINGLE STEP for the first few moves so that the feed pot can be used to effect the rapid moves until the single step mode is canceled.

Option N: This option is used to define a block in the program where all codes necessary to run the remainder of the program are present. The control will start reading from this line. When used in conjunction with the first parameter, the Start Block Line, the operation can be started deep into the program saving time normally used up by processing from line N0.001.

EXAMPLE: To use Option N, from the command mode type AU,#,,,N then press the ENTER button (where # is the block number to begin execution, and N is the block number to begin the search).

AU,1350, , ,1300 <ENTER> - Search begins at N1300, and execution starts at N1350.

Execution of the program will not begin until the message "WAITING -" appears on the screen, and the START or AUTO button is pressed. If the SINGLE STEP button is pressed before the message "WAITING" appears, the message "SINGLE STEP" will appear on the screen and the operator can single step the program by pressing the START button for each step. (See SINGLE STEP)

Note: Use SINGLE STEP for the first few moves so that the feed pot can be used to effect the rapid moves until the single step mode is canceled.