IMSE/CIS 381 Industrial Robotics

Lab Manual

Lab 2 Position Register and FRAMES Ⅱ

1. OBJECTIVES

The objective of this experiment is to let students have hands-on experience on fanuc robot operating and have basic knowledge of how to use the teach pendant. It will allow student to practice teaching positions and paths. Execute a program from the Standard Operators Panel.

2. INSTRUMENT SET-UP

Fanuc robot LR Mate 200iD, Fanuc robot M-1iA

3. CONTENT TASKS

- ✓ Create a Position Register
- ✓ Create a Shape Program

4. OPERATION PROCEDURES

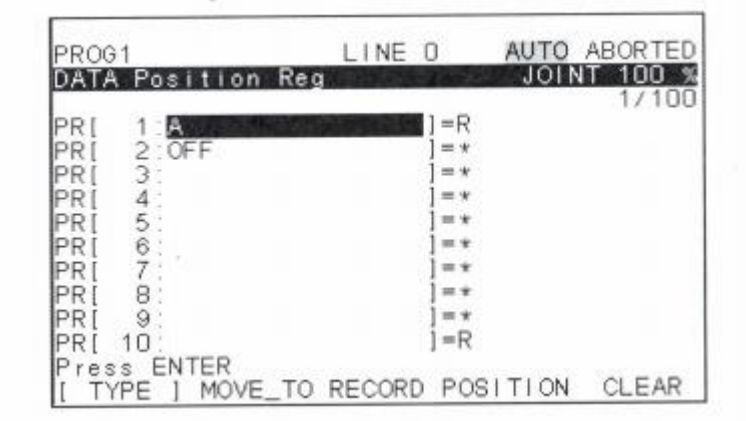
Condition:

• ***All personnel and unnecessary equipment are out of the workcell.***
• The mode select switch is in the T1 position.
• Fault lights are not illuminated.

Power up the robot by turning on the circuit breaker on the robot controller.

Create a Position Register

1. Press DATA.
2. Press f1, [TYPE].
3. Select Position Registers. You will see a screen similar to the following.



R indicates the position has been recorded.
* indicates the position has not been recorded.

CAUTION
Position registers are used in programs. Do not modify position register values unless you are sure how the position register is used in the system; otherwise, you could affect how programs are executed.

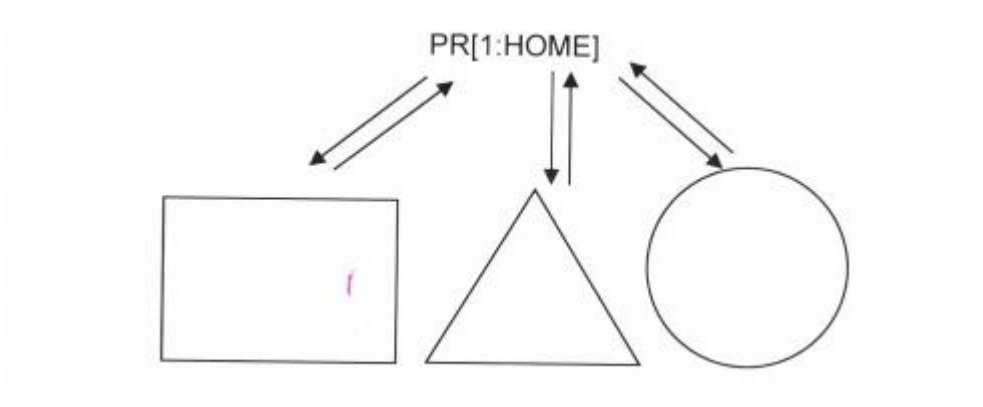
4. To add a comment:
a Move the cursor to the position register number and press ENTER
b Move the cursor to select a method of naming the comment.
c Press the function keys whose labels correspond to the name you want to give to the comment. These labels vary depending on the naming method you chose in Step b.
d For example, if you chose Upper Case, press a function key corresponding to the first letter. Press that key until the letter you want is displayed in the comment field. Press the right arrow key to move the cursor to the next space. Continue until the entire comment is displayed.
f When you are finished, press ENTER
5. To change the value of the position register, enter the new value by recording a position, or entering positional information.

6. To record a position:
a Press and hold the DEADMAN switch and turn on the teach pendant.
b Jog the robot to the position you want.
c Hold down the [SHIFT Jkey and press [F3J, RECORD. The * (asterisk) will change to an R to indicate the position has been recorded.
7. Create a position register name: HOME. The home position should be way far from the working area.
NOTE:
- The HOME position register must be recorded before it can be used.
- The word HOME is a comment. You must enter the comment or the word will not display. Pressing **SHIFT** + **COORD** displays the Jog Menu which allows students to activate the USER Frame and TOOL Frame that will be used to record the position.

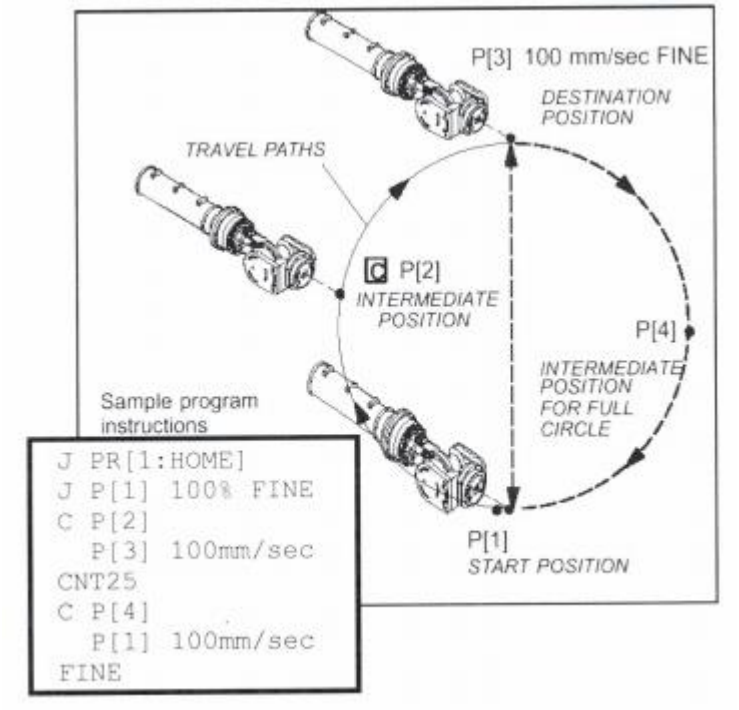
Create a Shape Program

1. Create one new program and call it SHAPES.
2. Program the robot to trace the square, triangle, and circle in one program. Separate each shape by returning to your HOME Position Register.

3. Define a USER frame first. The origin of the USER frame is set at the lower left point of the square, x axis along one end of the square and y axis along the other end of the square.
4. At the beginning of the program, use the user frame you just have defined by inserting a UFRSM=? Command.
5. Follow the traces on the paper and record points.
6. Run the program.



NOTE: Trace the path of a circle by putting together two arcs. Each arc requires three points: a start, an intermediate, and a destination position.



7. After finishing the programming, place the paper of traces elsewhere (in a different direction) in the work cell and try to define another USER frame to run he program on the same trace.

Requirements

Write a lab report of about the experiments. The report should contain at least the following:

a. Summary of the procedures in your own words (>150 words)
b. Your group’s shape program
c. Comment on each line of the above program
d. Pictures of the drawn shapes
e. Conclusions or what you learned in your own words (>100 words)