

RhinoArm

Jeff Caley



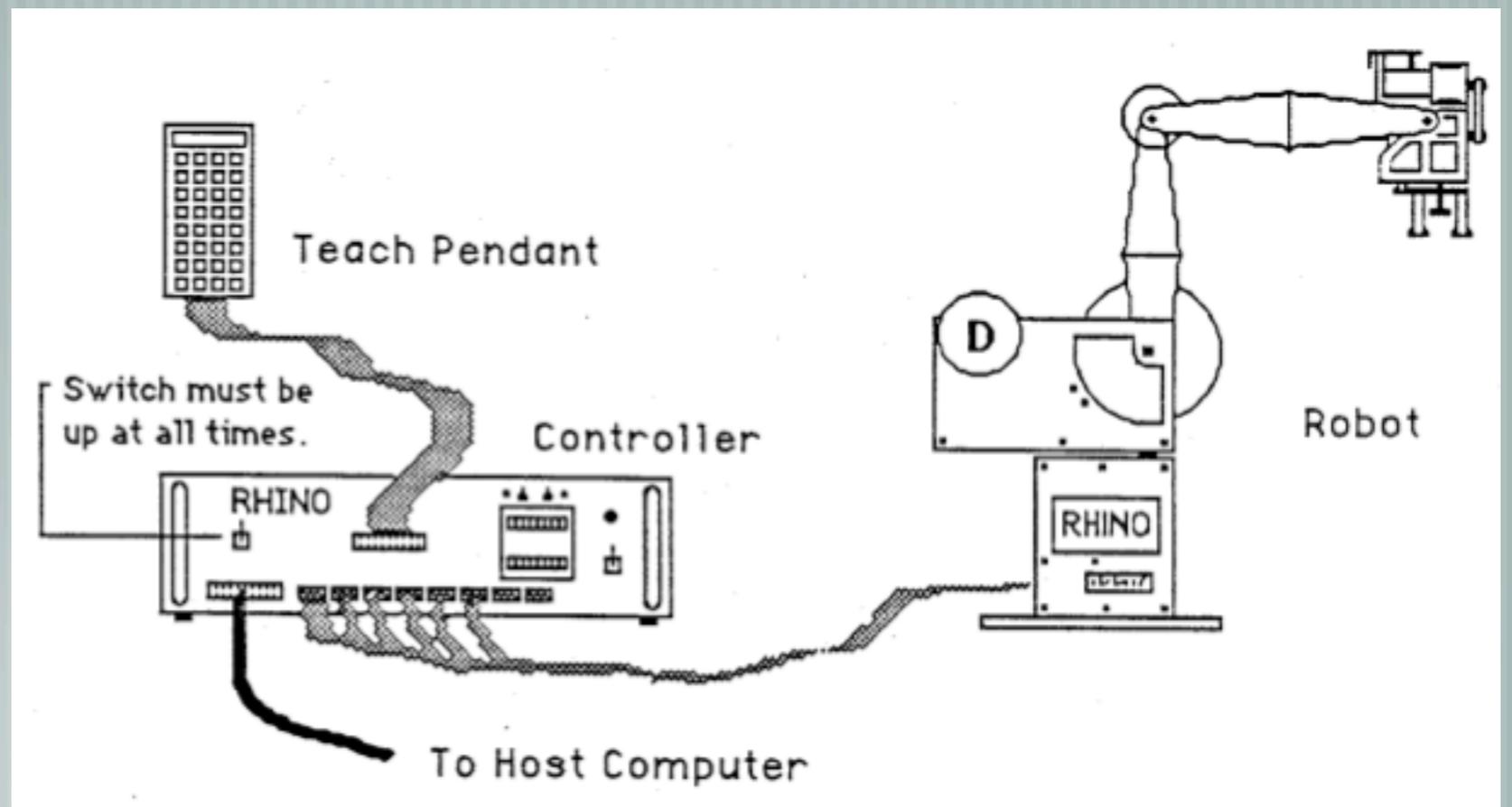
XR-3 Robotic Arm

The System

Robot Arm

Controller

Computer



Robot Arm

6 motors

5 Axes

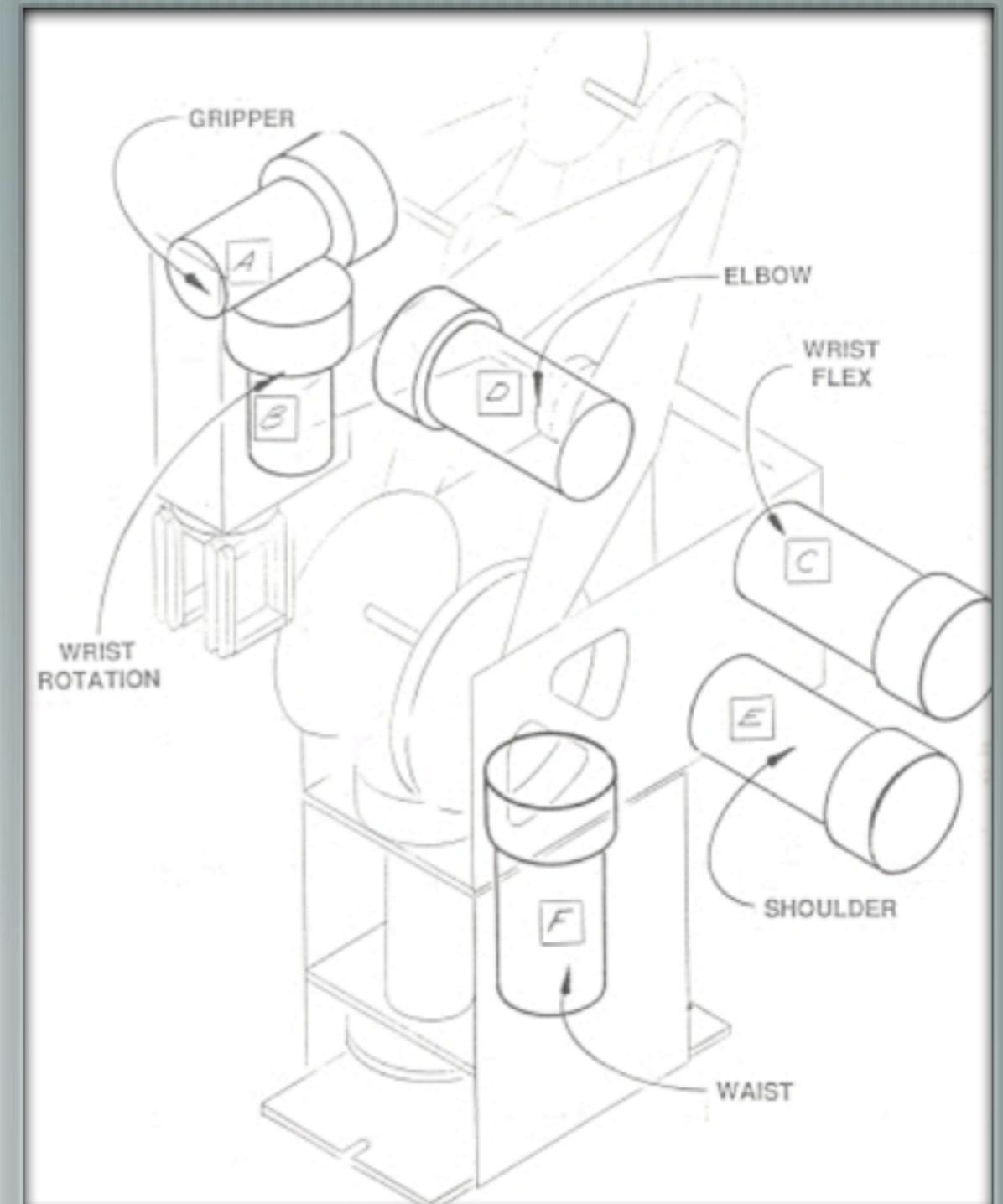
Motor "F" Body Rotation - 350 degrees
Motor "E" Shoulder Rotation - 210 degrees
Motor "D" Elbow Rotation - 265 degrees
Motor "C" Wrist Rotation - 310 degrees
Motor "B" Gripper Rotation - +/- 7

C - .0793 degrees

D - .1145 degrees

E - .1145 degrees

F - .1374 degrees



Goal

— [Talk to Robot

— C#

— [Inverse Kinematics Problem

— A* Search

Tree Expand

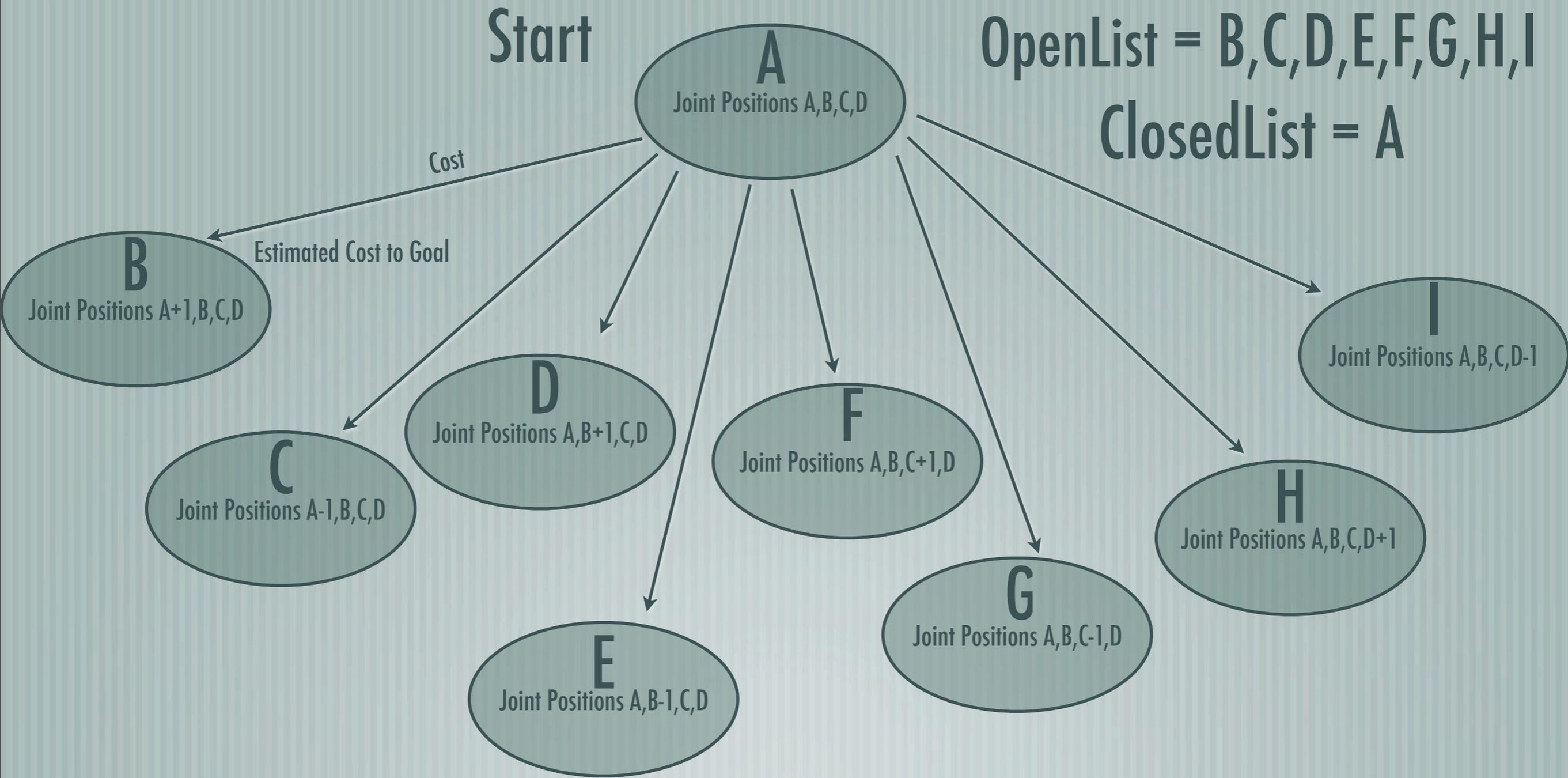
Start



OpenList = A

ClosedList = Null

Tree Expand



Heuristic

— [Straight Line Path



Heuristic

Not Really A^*

Estimated Distance(A) - Estimated Distance(A-Child)

Average



Robot Control

Serial Communication

ASCII commands

Optical Motor Control

"C1\r"

C - .0793 degrees

D - .1145 degrees

E - .1145 degrees

F - .1374 degrees



Issues

— [Heuristic

— [Communicating via Serial Port

— [Unity to Serial

— [Robot HOME

Serial Communication

— [9-25 Pin Adapter

— [25-25 Pin Null Modem Cable

COMPUTER		MARK III
Pin 2	—————	Pin 2
Pin 3	—————	Pin 3
Pin 5	—————	Pin 7
Pin 4]	[Pin 4
Pin 6]	[Pin 5
Pin 7]	Pin 6
Pin 8]	[Pin 8
		[Pin 20

Unity to Serial

— [Unity can't talk to Serial

— [Export to XML

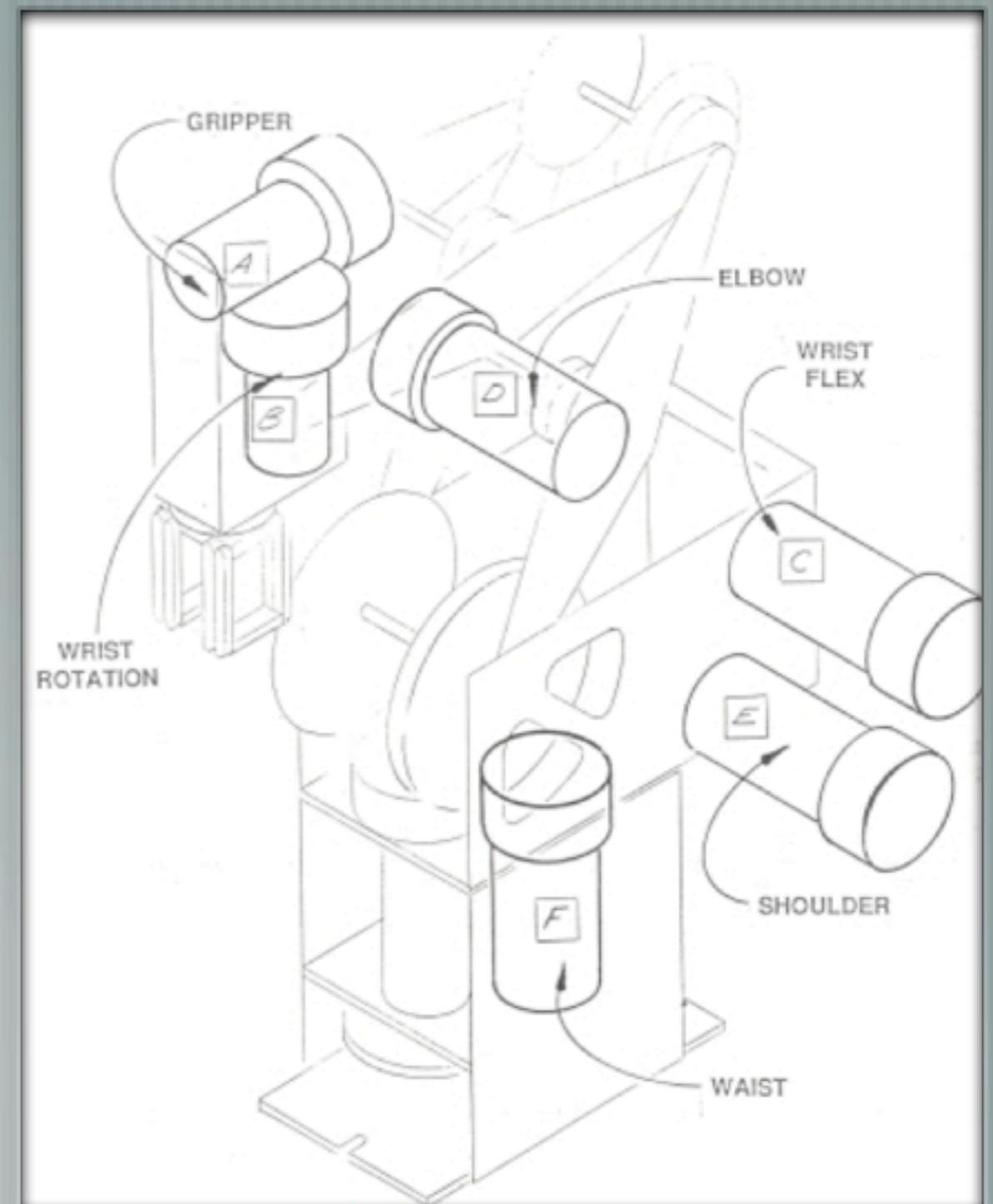
— [Input and Run in Separate Program

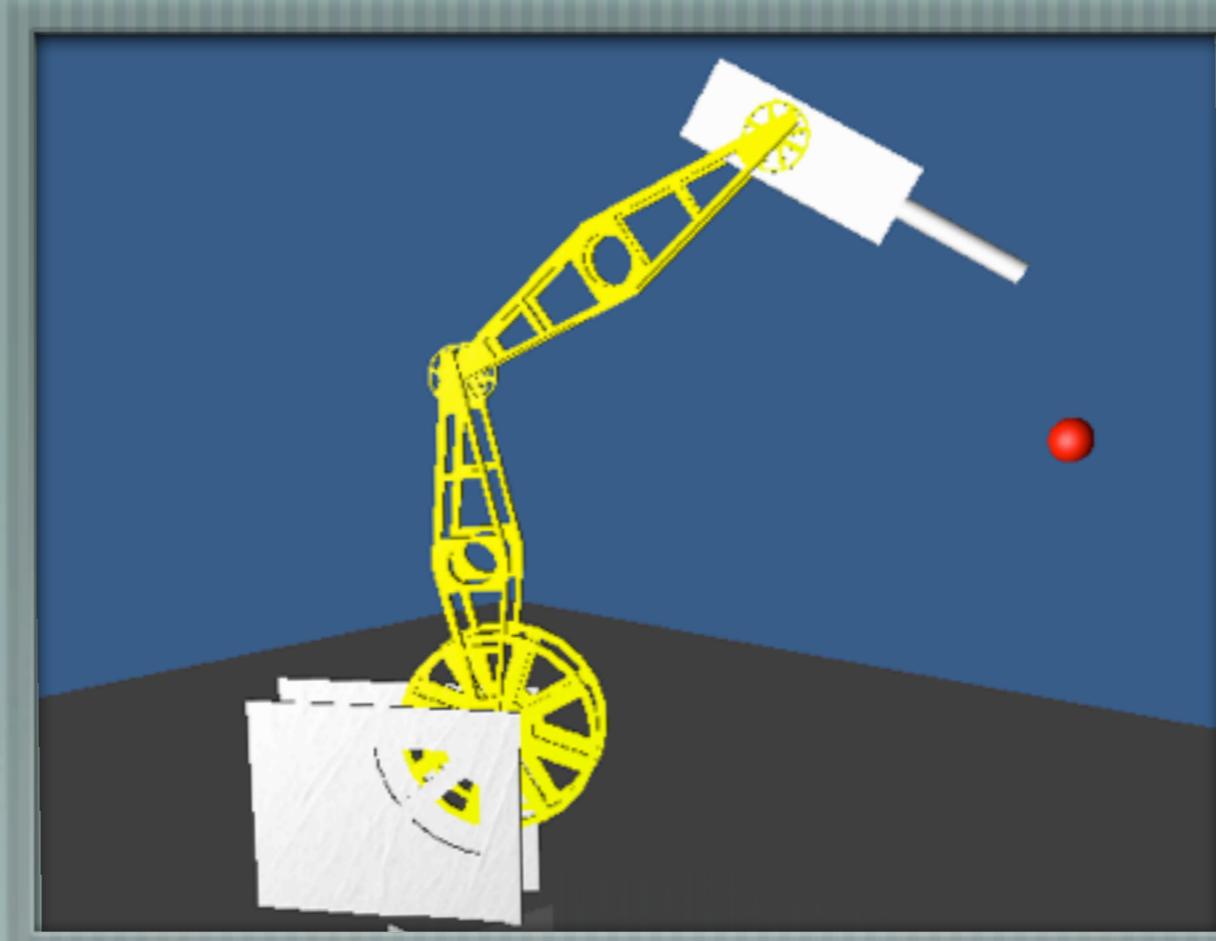
Robot HOME

Microswitches

Register shift

"I\r" returns #





Demo

The End

Questions?