Leaving Certificate

Technology

Pneumatics

Practical Circuit Building
1. **Identify the components on the SMC Kits.**

![Image of SMC Kits components]

- Pressure Regulator
- Compressor
- Compressed Air Manifold
- Shuttle Valve
- Solenoid valves
- Pneumatic Pilot valves
- 3/2 Lever valves
- Two pressure valve
- Flow control valves
- 3/2 Pushbutton valves
- Single acting & double Actuators

2. **Familiarise yourself with the Pneumatic valve ports nomenclature.** (No standard nomenclature, Letters and Numbers used, we are keeping to the Number system to avoid confusion? SMC kits use Letter system.)

![Diagram of valve ports]

- 3/2 Way directional control valve normally closed
- 5/2 Way directional control valve
- 3/2 Way directional control valve normally open
3. **First simple circuit, 3/2 Pushbutton valve with a single acting actuator.**

4. **Actuator speed control using a 3/2 Pushbutton valve with a single acting actuator and flow control valve.**
5. Second circuit, a 3/2 pushbutton valve, a 5/2 Pilot controlled pneumatic valve and a double acting actuator.

6. Double acting actuator speed control using a 3/2 pushbutton valve, a 5/2 Pilot controlled pneumatic valve and two flow control valves. (Demonstrates how the piston speed may be different on the in and out strokes.)
**Logic circuits.**

7. **The OR Logic circuit using two 3/2 pushbutton valves, a shuttle valve and a single acting actuator.**

8. **The AND circuit using two 3/2 pushbutton valves, a two pressure valve and a single acting actuator.**
9. Semi automatic circuit using a 3/2 pushbutton control valve, a 3/2 roller lever valve, a 5/2 pilot valve, a single and a double acting actuator.

10. Fully automatic circuit using a 5/2 Solenoid control valve, a Single and a Double acting actuator. Control is achieved using a feedback signal to the PIC Logicator interface board and Software.
Fully Automatic Pneumatic Circuit

The programme starts and goes to the decision box, checks to see if Input 7 is High. If it is low it goes around the right hand loop and checks again until it gets a High. When Input 7 is High, it makes Output 1 High. It then waits 1 second and makes Output 1 low. It follows to loop around to the top of the decision box and checks again for the next cycle. This simple programme switches on and off the Solenoid controlling the flow of compressed air to the Actuator.

Simple PIC Logicator Control programme for the Automatic circuit.