PIC-MICROCONTROLLER AND OUTPUT BITS

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On behalf of The World Association of Technology Teachers

# W.A.T.T.

World Association of Technology Teachers

This exercise can be printed and used by teachers and students. It is recommended that you view the website (www.technologystudent.com) before attempting the design sheet .

The animatronic clown is controlled by a PIC Microcontroller. Although it has eight outputs although only six are in use. Outputs 0, 1 and 2 control the LEDs positioned in the clowns hat. Outputs 3, 4, and 5 control the arms and bow tie.
When the outputs are on this is represented as LOGIC STATE 1. When the outputs are off this is represented by LOGIC STATE 0.

A MOVEMENT	B LIGHTS
3 = ARM A	0 = RED
4 = ARM B	1 = AMBER
6 = BOW TIE	2 = GREEN

The PIC microcontroller is programmed so that when it is turned on it goes through a simple routine:
Both arms rise,
the red and green LEDs turn on,
the bow tie then starts to revolve,
all out puts switch off.

Complete the table below to show the output bit pattern when the microprocessor circuit is first turned on.

OUTPUT BIT	7	6	5	4	3	2	1	0

The theme park owner wants the animatronic clown to follow the sequence outlined below.

^ rm A rises and then falls back in position.
The RED LED lights and stays on.
The AMBER LED lights and stays on.
The Green LED lights and stays on.
All Lights turn off.
The bow tie revolves whilst ARM B rises.
The bow tie stops and arm B falls.

7 6 5 4 3 2 1 0

BOW TIE 'C'

ARM 'B'

ARM 'A'

RED

AMBER

GREEN

A   B
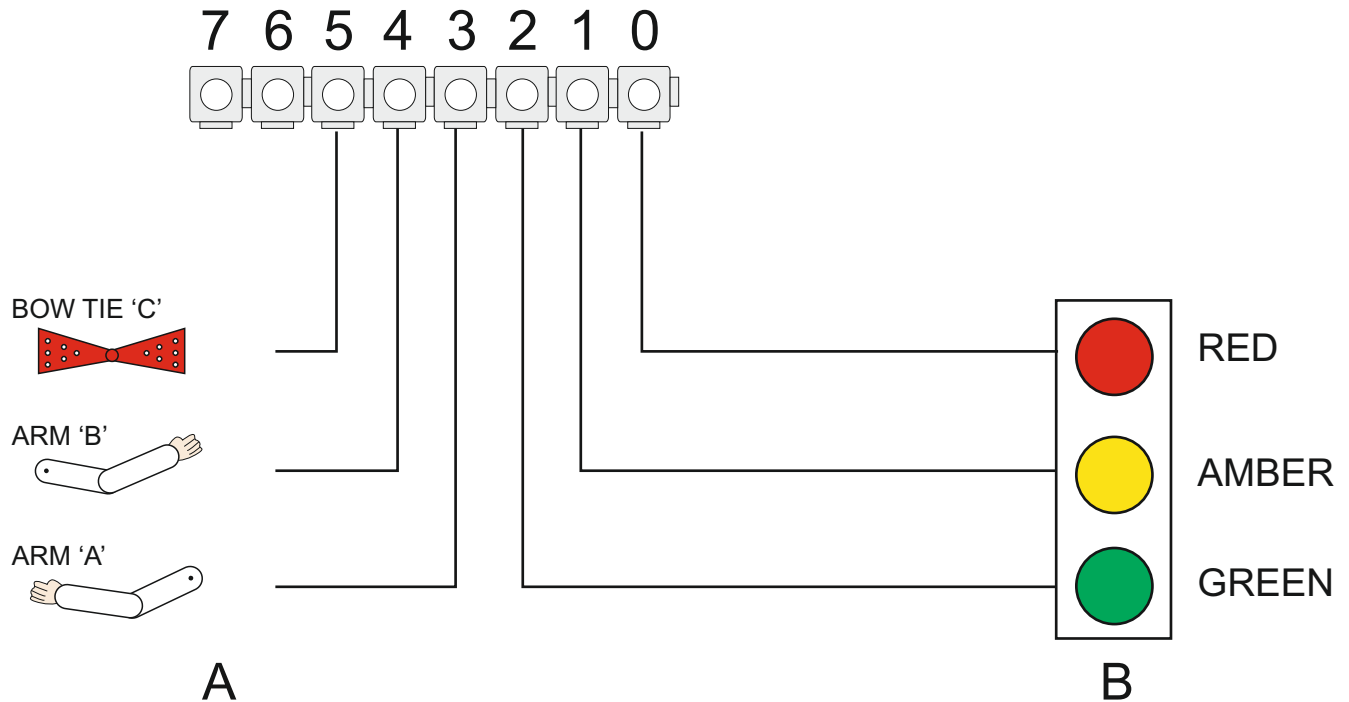
Complete the table below to show the output bit pattern when the sequence stated above is carried out. Alongside each output bit, write the command that is taking place. The first stage is already written in position.

OUTPUT BITS

7	6	5	4	3	2	1	0	
								Arm A rises and then falls back in position.