MicroWorlds Robotics - Motors and Lamps

Connect motors or lamps to Ports A, B and C on the RCX Microcomputer. Type the following commands in the RCX Direct Mode Panel:

This instruction turns on the motor or lamp connected to Port A:

`aon` (press **Enter**)

The commands bon and con address Ports B and C in the same manner.

This instruction turns it off:

```
aoff
```

The commands `boff` and `coff` address Ports B and C in the same manner.

This instruction turns the motor or lamp on for a specific time (one second in this example). The input to `aonfor` is in tenths of a second.

```
aonfor 10
aonfor 50
```

The commands `bonfor` and `confor` address Ports B and C in the same manner.

This turns on the motors or lamps connected to Ports A and B, both at the same time.

```
aon bon
```

Turn off both motors or lamps.

```
aoff boff
```

The next instruction turns on the motor or lamp connected to Port A for two seconds, then the one connected to Port B for 2 seconds. `Aonfor` is completed before `bonfor` is executed.

```
aonfor 20 bonfor 20
```

This turns on the motors or lamps connected to Ports A and C for two seconds, both at the same time (contrast with the previous instruction).

```
aon con wait 20 aoff coff
```

The following sequence of instructions turns on the motor connected to Port A, reverses its direction (`ard` stands for `a`, `r`everse `d`irection) and stops it. Execute these instructions as three separate lines to see the effect. `Ard` has no effect on lamps.

```
aon
ard
aoff
```

The commands `brd` and `crd` address Ports B and C in the same manner.

The following sequence turns on the motors connected to Ports A and C, sets the direction of the motor A in one direction (called ***thisway***) and sets the motor C in the other direction (***thatway***). Thisway and thatway have no effect on lamps.

```
aon con
athisway
cthatway
aoff coff
```

The actual direction of rotation depends on the way the connectors are placed on the RCX Microcomputer but if both connectors are placed in the same manner (say with the wire going out to the back of the RCX Microcomputer), one is set to `thisway` and the other to `thatway`, the motors run in opposite directions. This feature is useful when constructing a device in which two motors are set back to back.

This instruction sets the power level for the motor or lamp connected to Port B.

```
bsetpower 3
bonfor 30
bsetpower 7
bonfor 30
boff
```

The commands `asetpower` and `csetpower` address Ports A and C in the same manner.

The last instruction you sent the car will be repeated by pushing the Green button on the car. You MUST beam it to the car the first time. Then you can put the car on the floor and use the button to activate it. Try typing the following in the Direct Mode Panel, then try it away from the transmitter.

```
aon bon con wait 30 aoff boff coff
```

The RCX brick has 5 program slots in which programs can be stored. You will need to write a Logo procedure for the car to follow - complete with a 'TO' and an 'END'. The same directions apply as far as beaming it to the car the first time. Try typing the following in the top 'Download' window.

```
to flash
repeat 5 [bon wait 5 boff]
end
```

Press the grey PGM (Program) button on the brick. It should cycle through the 5 programmable slots. Pick one of the slots and press the 'Download' button on the screen. You MUST beam it to the car from the Direct Mode Panel at the bottom the first time only. (type 'flash' and press return) Then you can put the car on the floor and use the Green button to activate the procedure in the listed program slot.

Try out your procedure away from the transmitter.

Now type the following in the top 'Download' window.

```
to shimmy
aon con
repeat 5 [wait 5 ard crd]
aoff coff
end
```

Press the grey PGM (Program) button on the brick. Pick a different slot on the brick and press the 'Download' button. Remember to test it from the Driect Mode Panel first.

Try out your procedure away from the transmitter.

Using what you have learned - program the car to do the following in the three remaining programmed slots. Then demonstrate all 5 programs for the teacher away from the transmitter.

- Move forward in a straight line (be sure to check that both motor A and C are turning in the same direction. Use `ard crd athisway athatway cthisway cthatway` to change the direction.)
- Turn right in place (again - think about which direction you want each motor to go. Use `ard crd athisway athatway cthisway cthatway` to change the direction.)
- Turn left in place (again - think about which direction you want each motor to go. Use `ard crd athisway athatway cthisway cthatway` to change the direction.)