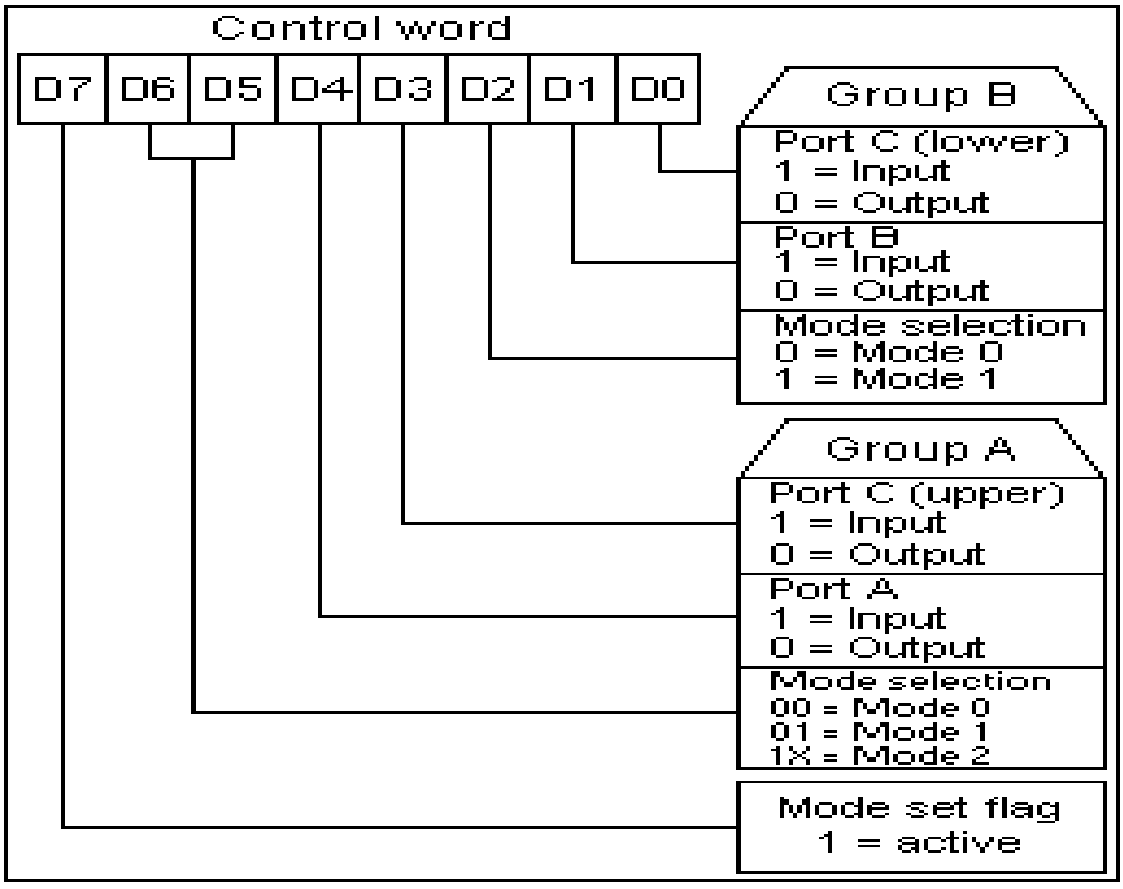
Control Word and BSR Mode Format

Control Word Format



Control Word format in input/output mode

- The figure shows the control word format in the input/output mode. This mode is selected by making **D7 = '1'** .

- **D0, D1, D3, D4** are for lower port C, port B, upper port C and port A respectively. When D0 or D1 or D3 or D4 are *"SET"*, the corresponding ports act as input ports. For eg, if D0 = D4 = '1', then lower port C and port A act as input ports. If these bits are *"RESET"*, then the corresponding ports act as output ports. For eg, if D1 = D3 = '0', then port B and upper port C act as output ports.

- **D2** is used for mode selection for group B (Port B and Lower Port C). When D2 = '0', mode 0 is selected and when D2 = '1', mode 1 is selected.

- **D5, D6** are used for mode selection for group A (Upper Port C and Port A). The format is as follows:

D6	D5	mode
0	0	0
0	1	1
1	x	2

Example: *If port B and upper port C have to be initialised as input ports and lower port C and port A as ouput ports (all in mode 0), what is the control word?*

- 1. Since it is an input/ouput mode, **D7 = '1'**.
- 2. Mode selection bits, **D2, D5, D6 are all '0'** for mode 0 operation.
- 3. Port B should operate as input port, hence, **D1 = '1'**.
- 4. Upper port C should also be an input port, hence, **D3 = '1'**.
- 5. Port A has to operate output port, hence, **D4 = '0'**.
- 6. Lower port C should also operate as output port, hence, **D0 = '0'**.

Applying the corresponding values to the format in input/output mode, we get the control word as **"8A (hex)"**

BSR mode format

File:8255ctrlformat bsr.gif
Control Word format in BSR mode

- The figure shows the control word format in BSR mode. This mode is selected by making **D7='0'**.

- **D0** is used for bit set/reset. When D0= '1', the port C bit selected (*selection of a port C bit is shown in the next point*) is **SET**, when D0 = '0', the port C bit is **RESET**.

- **D1, D2, D3** are used to select a particular port C bit whose value may be altered using D0 bit as mentioned above. The selection of the port C bits are done as follows:

D3	D2	D1	bit/pin of port C selected
0	0	0	PC0
0	0	1	PC1
0	1	0	PC2
0	1	1	PC3
1	0	0	PC4
1	0	1	PC5
1	1	0	PC6
1	1	1	PC7

- **D4, D5, D6** are not used.

Example: *If the 5th bit (PC5) of port C has to be "SET", then what is the control word?*

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  - 1. Since it is BSR mode, **D7 = '0'**.
  - 2. Since D4, D5, D6 are not used, assume them to be '**0**'.
  - 3. PC5 has to be selected, hence, **D3 = '1', D2 = '0', D1 = '1'**.
  - 4. PC5 has to be set, hence, **D0 = '1'**.

Applying the above values to the format for BSR mode, we get the control word as **"0B (hex)"**.

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