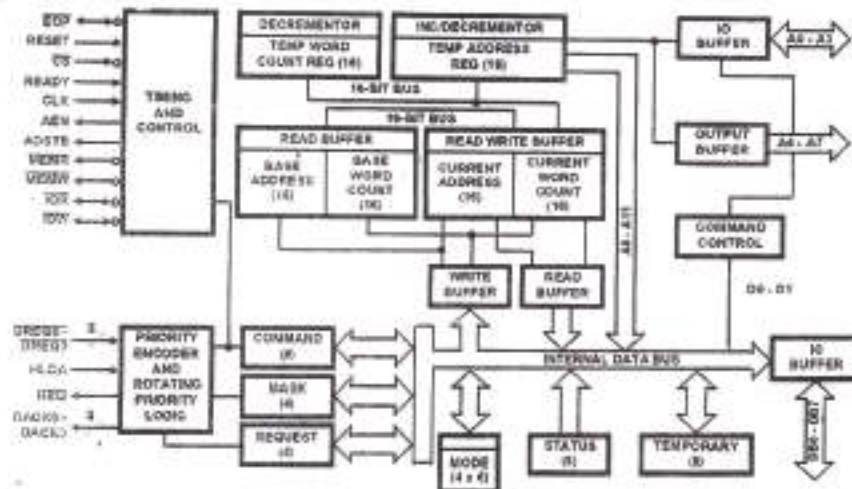


Architecture of 8237

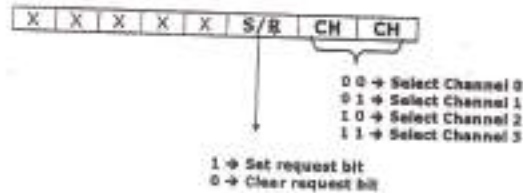


The **INTERNAL REGISTERS (ARCHITECTURE)** of 8237 are explained as follows:

- 1) **BAR** (Base Address Register)
 - It is a **16-bit** register.
 - Each channel has one BAR.
 - During Idle cycle, μP writes the starting address of the data transfer into the BAR.
 - Thereafter, the contents of BAR do not change throughout the transfer.
- 2) **BWCR** (Base Word Count Register)
 - It is a **16-bit** register.
 - Each channel has one BWCR.
 - During Idle cycle, μP writes the number of bytes to be transferred into the BWCR.
Eg: if 5 bytes are to be transferred the μP writes 0004H into the BWCR.
 - Thereafter, the contents of BWCR do not change throughout the transfer.
- 3) **CAR** (Current Address Register)
 - It is a **16-bit** register.
 - Each channel has one CAR.
 - It is used to hold the current address for the DMA Transfer.
 - After each byte is transferred, the CAR is automatically incremented/decremented.
 - The μP can read the contents of CAR.
- 4) **CWCR** (Current Word Count Register)
 - It is a **16-bit** register.
 - Each channel has one CAR.
 - It is used to hold the current address for the DMA Transfer.
 - After each byte is transferred, the CAR is automatically incremented/decremented.
 - The μP can read the contents of CAR.

5) Request Register

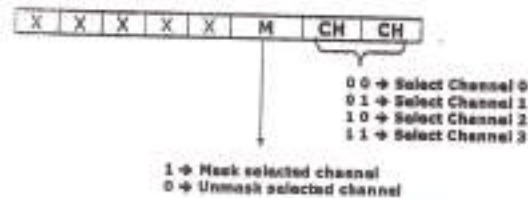
- It is a 4-bit register having individual bits per channel.
- It is used to store the DMA Request of the peripheral device.
- The request bits can be set/reset (through program) as follows:



6) Mask Register

- It is a 4-bit register having individual bits per channel.
- This register holds the masking information about the channels.
- By changing these bits the channels can be masked/unmasked in the following two ways:

i. Single Mask Command



- Using this command, an individual channel can be masked/unmasked.
- This action would not effect the other channels.

ii. All Mask Command



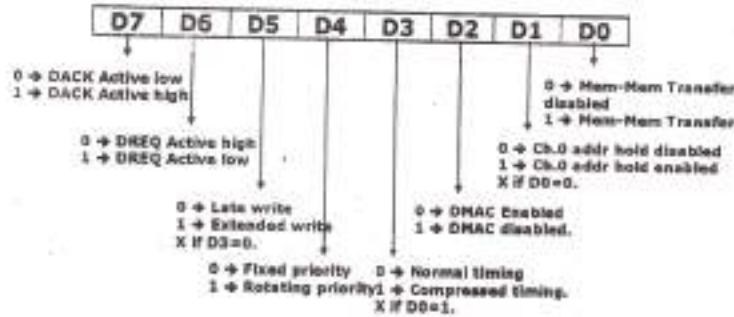
- Using this command, all channels can be simultaneously masked/unmasked.
- This action would effect all channels together.

7) Temporary Register

- It is an 8-bit register.
- It is used to store data temporarily during memory-to-memory transfer only.

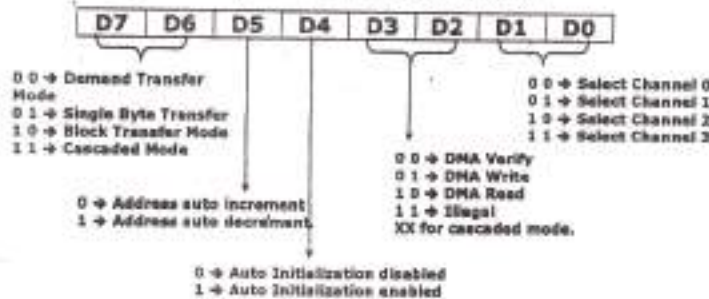
8) Command Register

- It is an 8-bit register.
- It is used to store the command word.
- The μP writes the command word.



9) Mode Register

- It is an 8-bit register.
- Each channel has one Mode Register.
- It is used to program the operational mode of that channel.



10) Status Register

- It is an 8-bit register.
- It stores the status word of the 8237.
- The μP can read the Status Register.

