

# VGA Lab Note

Last updated 5/20/20

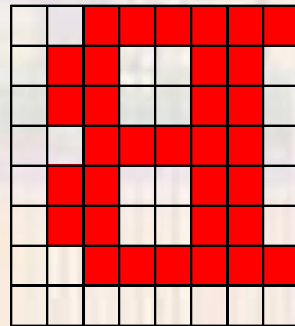
# VGA Lab Note

These slides describe the character buffer ROM used in the VGA display lab

# VGA Lab Note

- Character ROM

- Displayed Character size: 1 byte x 8 words = 8 bytes



- REVERSED

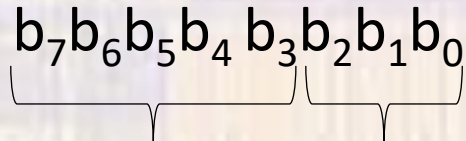
- 32 characters

- ROM size: 8 Bytes x 32 characters = 256B = 2048b

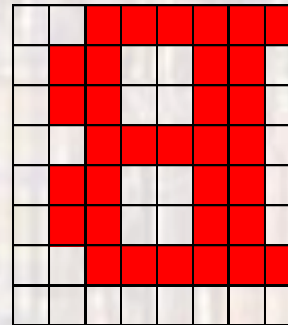
# VGA Lab Note

- Character ROM
  - 32, 8 byte characters

- Memory Address



32 possible characters 8 bytes /letter



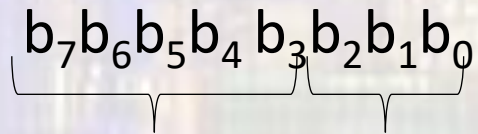
- Memory Addresses

- B – 00001 xxx
- Z – 11001 xxx

# VGA Lab Note

- Character ROM

- Memory Address



32 possible characters 8 bytes /letter

- Memory Addresses

- B – 00001 xxx

Address	Value
0000 1000	0x3F →
0000 1001	0x66 →
...	
0000 1110	0x3F →
0000 1111	0x00 →

A 6x8 grid representing the character ROM. The grid is 6 rows high and 8 columns wide. Red cells indicate characters, and white cells indicate blank space. Arrows point from the table to the corresponding cells in the grid.


# VGA Lab Note

- Display Characters
  - B – 00001 xxx
  - Z – 11001 xxx
- Display each character for 1 sec
  - Loop 5 memory address MSB bits at 1 sec interval
- Display a character
  - Synchronize the 3 memory address LSB bits to pixel\_x and pixel\_y
    - or
  - Create a mini-display buffer
    - or
  - Create a full display buffer

# VGA Lab Note

- Display Characters
  - Why are the characters in the memory backwards???