CHAPTER-LCD MATRIX DISPLAY

16X2 -LCD DISPLAY

16xX LCD Display:

- 16 to 20 character display in a line.
- 2 to 4 line Display.
- Can display Alphabets, Numbers, Symbols, and Custom Symbols.
- Data's to be send ASCII format.

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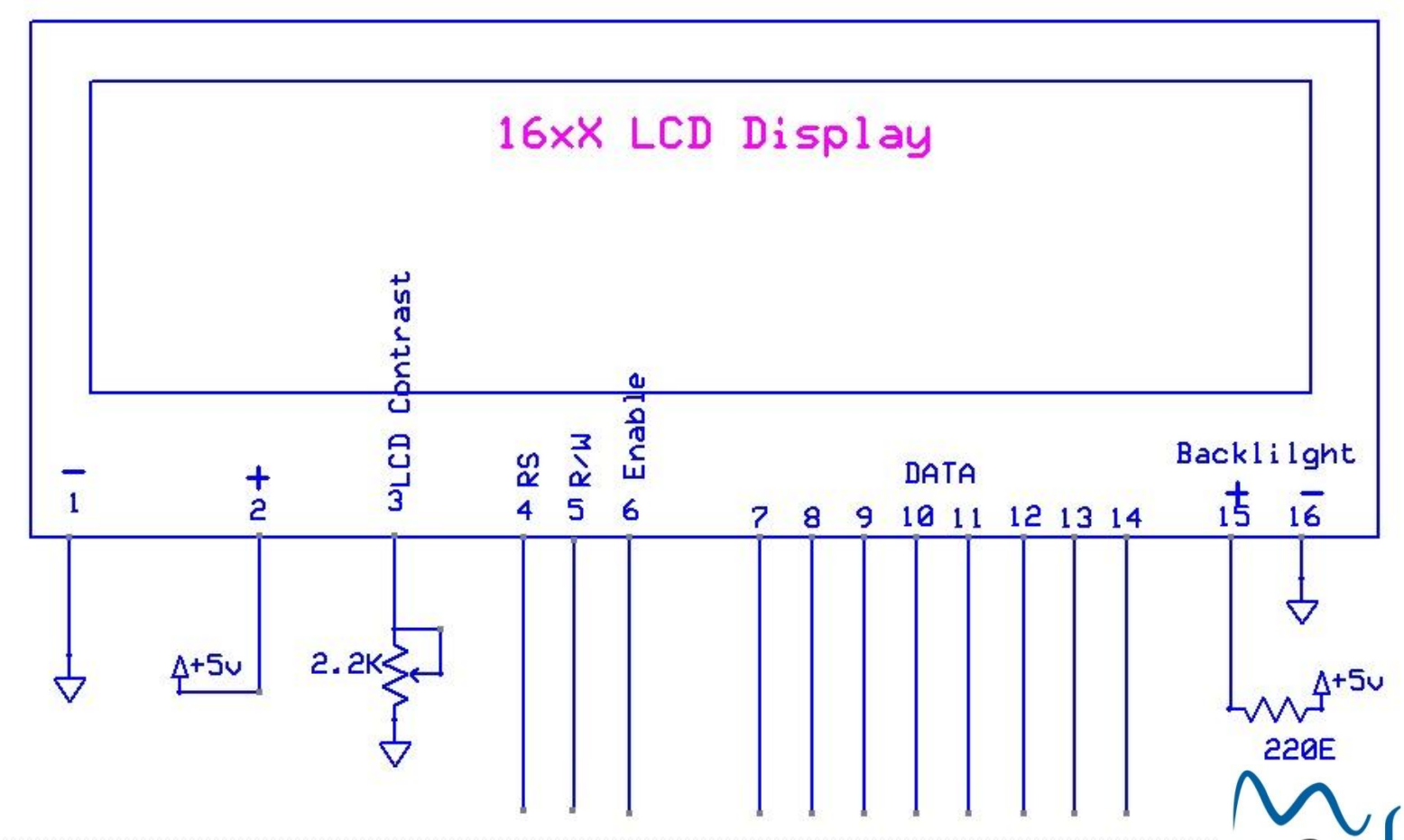
LCD Display Connection Diagram:



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LCD Commands: (RS Pin=0)

LCD Command Codes

Code (Hex)	Command to LCD Instruction Register
1	Clear display screen
2	Return home
4	Decrement cursor (shift cursor to left)
6	Increment cursor (shift cursor to right)
5	Shift display right
7	Shift display left
8	Display off, cursor off
A	Display off, cursor on
C	Display on, cursor off
E	Display on, cursor blinking
F	Display on, cursor blinking
10	Shift cursor position to left
14	Shift cursor position to right
18	Shift the entire display to the left
1C	Shift the entire display to the right
80	Force cursor to beginning to 1st line
C0	Force cursor to beginning to 2nd line
38	2 lines and 5x7 matrix

LCD Data Fonts: (RS Pin=1)

FONT TABLE

b7-b4 / b3-b0	0000	0010	0011	0100	0101	0110	0111	1010	1011	1100	1101	1110	1111
0000	CG RAM (1)												
0001	(2)												
0010	(3)												
0011	(4)												
0100	(5)												
0101	(6)												
0110	(7)												
0111	CG RAM (8)												
1000	CG RAM (1)												
1001	(2)												
1010	(3)												
1011	(4)												
1100	(5)												
1101	(6)												
1110	(7)												
1111	CG RAM (8)												

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Display Initialization Sequence :

- Say Display Type (P)
- Make Display ON (P)
- Say Address to Display (P)
- Place Data to Display(P)
  - (P) Pulse to Display

Pulse to Display:

```
void pulse()
{
   EN=1;                    //Enable the EN Pin
   delay(1000);             //Delay for Data Fetch to LCD
   EN=0;                    //Disable the EN Pin
   delay(1000);
}
```

Say Display Type:

```
void type()
{
   RW=0;              //Disable the RW Pin
   RS=0;              //Disable the RS Pin
   LCD=0x38;          //Send Display Type
   pulse();           //Pulse for Data fetching
}
```

Make Display ON:

```
void on()
{
   RW=0;              //Disable the RW Pin
   RS=0;              //Disable the RS Pin
   LCD=0x0E;          //Send Display ON
   pulse();           //Pulse for Data fetching
}
```

Say Address to Display:

```
void address()
{
   RW=0;              //Disable the RW Pin
   RS=0;              //Disable the RS Pin
   LCD=0x80;          //Send Display Address
   pulse();           //Pulse for Data fetching
}
```

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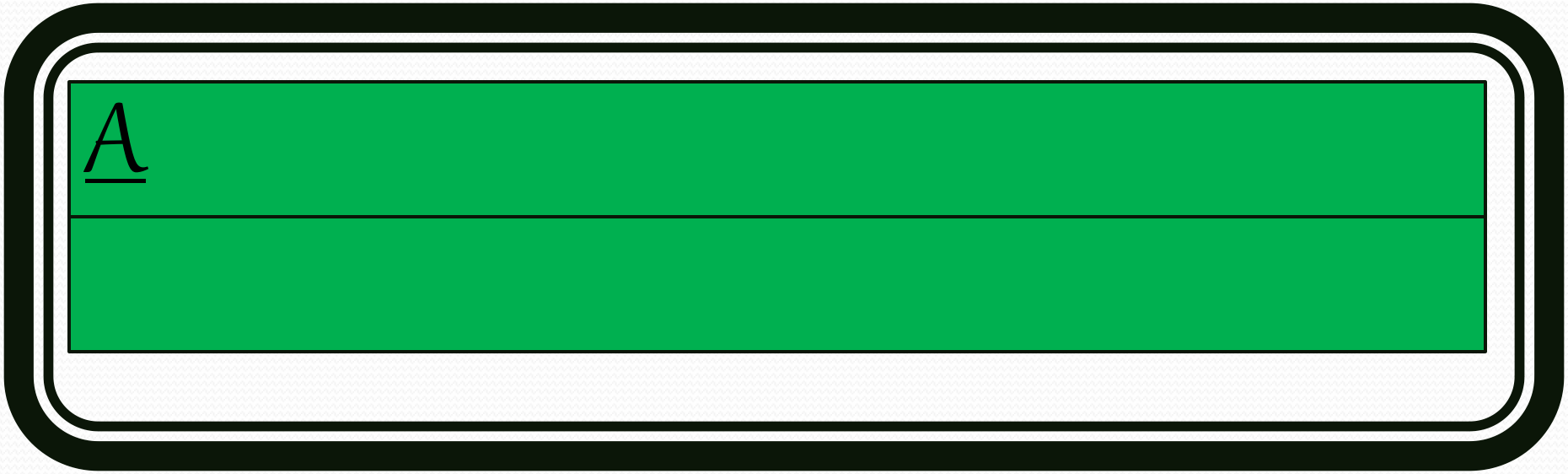
Place Data to Display:

```
void display()
{
   RW=0;              //Disable the RW Pin
   RS=1;              //Enable the RS Pin
   LCD='A';           //Send Display Data
   pulse();           //Pulse for Data fetching
}
```

DISPLAY OUTPUT:



QUERIES??

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