

TIC TAC TOE GAME USING AT-MEGA 16

SUBMITTED BY:

N.S.RAGHAVAN
P.VINOD PRASANTH

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JCET.

ABSTRACT:

Our project implements the game “Tic Tak Toe” using ATMEGA 16 microcontroller, having 4 port 40 pin configuration. In this game two players play to find who can first form three consecutive “x” or “o”. This has been implemented using UART(Universal Asynchronous Receiver Transmitter) and the keyboard is used to give input in computer hyper terminal. For connecting UART to ATMEGA16, we use MAX 232 IC.

To display the choice taken by a player we use red light emitting diode for Player 1 and green light emitting diode for Player 2. The controller is also able to predict that if either of the players won or is it a draw.

OVERVIEW OF CIRCUIT:



COMPONENTS USED:

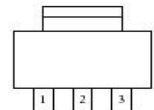
1. Power supply board.
2. ATMEGA 16.
3. UART.
4. MAX 232.
5. Computer hyper-terminal.
6. LED's.

A detailed explanation of the components and their connections are explained.

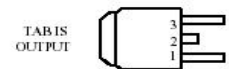
➤ POWER SUPPLY BOARD:

The power supply board consists of AMS 1117 IC. We use AMS 1117 because its voltage drop is very low when compared to other voltage regulator. Also it can be adjusted to provide the 5V input that both ATMEGA16 and MAX232 require. The circuit diagram is shown.

SOT-223 Top View

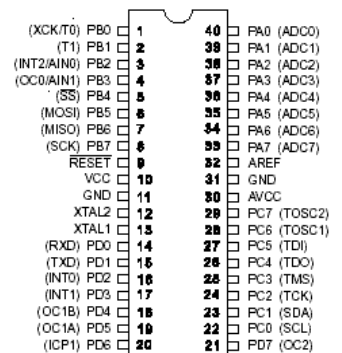


TO-252 FRONT VIEW



➤ ATMEGA 16:

The ATmega16 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.



➤ UART:

Universal asynchronous receiver/transmitter, abbreviated UART is a type of "asynchronous receiver/transmitter", a piece of computer hardware that translates data between parallel and serial forms. UART's are commonly used in conjunction with communication standards such as EIA RS-232, RS-422 or RS-485. The universal designation indicates that the data format and transmission speeds are configurable and that

the actual electric signaling levels and methods (such as differential signaling etc.) typically are handled by a special driver circuit external to the UART.

A UART is usually an individual integrated circuit used for serial communications over a computer or peripheral device serial port. UART's are now commonly included in microcontrollers. A dual UART, or DUART, combines two UART's into a single chip. Many modern ICs now come with a UART that can also communicate synchronously; these devices are called USART's (universal synchronous/asynchronous receiver/transmitter).

➤ MAX 232:

The MAX232 is an integrated circuit that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The MAX232 is a dual driver/receiver and typically converts the RX, TX, CTS and RTS signals.

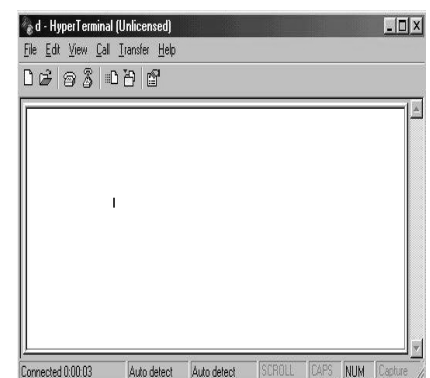
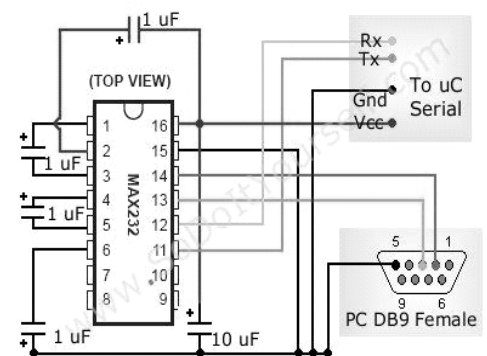
The drivers provide RS-232 voltage level outputs (approx. ± 7.5 V) from a single +5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to +5 V range, as power supply design does not need to be made more complicated just for driving the RS-232 in this case.

The receivers reduce RS-232 inputs (which may be as high as ± 25 V), to standard 5 V TTL levels. These receivers have a typical threshold of 1.3 V, and a typical hysteresis of 0.5 V.

The newer MAX3232 is also backwards compatible, but operates at a broader voltage range, from 3 to 5.5 V. Pin to pin compatible: ICL232, ST232, ADM232, HIN232.

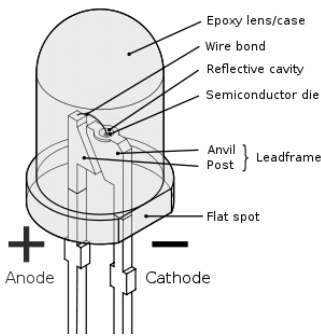
➤ Computer hyper-terminal.

Computer hyper terminal is used here to give input and receive output from MAX232. A screen shot has been displayed.



➤ LED:

A light-emitting diode (LED) is a semiconductor light source. LED's are used as indicator lamps in many devices and are increasingly used for other lighting. Introduced as a practical electronic component in 1962, early LED's emitted low-intensity red light, but modern versions are available across the visible, ultraviolet and infrared wavelengths, with very high brightness. Here we use 9 led's for each player, one set red and other set green.



REFERENCE:

- ✓ www.wikipedia.org
- ✓ www.avrfreaks.com
- ✓ www.instructables.com

CONCLUSION:

Thus our project of using AT MEGA 16 to implement “Tic Tac Toe” was implemented and the output was verified.