INFRARED REMOTE CONTROL:-



INTRODUCTION:-

A **remote control** is a component of an electronics device, most commonly a television set, used for operating the device wirelessly from a short line-of-sight distance.

The *remote control* can be contracted to *remote* or *controller*. It is known by many other names as well, such as converter *clicker*, *didge*, *flipper*, *the tuner* or *the changer*. Commonly, remote controls are Consumer IR devices used to issue commands from a distance to televisions or other consumer electronics such as stereo systems, DVD players and dimmers. Remote controls for these devices are usually small wireless handheld objects with an array of buttons for adjusting various settings such as television channel, track number, and volume. In fact, for the majority of modern devices with this kind of control, the remote contains all the function controls while the controlled device itself only has a handful of essential primary controls. Most of these remotes communicate to their respective devices via infrared (IR) signals and a few via radio signals. Television IR signals can be mimicked by a universal remote, which is able to emulate the functionality of most major brand television remote controls. They are usually powered by small AAA or AA size batteries.

A BRIEF INTRODUCTION TO 8051

MICROCONTROLLER-:

When we have to learn about a new computer we have to familiarize about the machine capability we are using, and we can do it by studying the internal hardware design (devices architecture), and also to know about the size, number and the size of the registers.

         A microcontroller is a single chip that contains the processor (the CPU), non-volatile memory for the program (ROM or flash), volatile memory for input and output (RAM), a clock and an I/O control unit. Also called a "computer on a chip," billions of microcontroller units (MCUs) are embedded each year in a myriad of products from toys to appliances to automobiles. For example, a single vehicle can use 70 or more microcontrollers. The following picture describes a general block diagram of microcontroller.

**AT89S52:** The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel’s high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pinout. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory pro-grammer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller, which provides a highly flexible and cost-effective solution to many, embedded control applications. The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM con-tents but freezes the oscillator, disabling all other chip functions until the next interrupt



The hardware is driven by a set of program instructions, or software. Once familiar with hardware and software, the user can then apply the microcontroller to the problems easily.

The pin diagram of the 8051 shows all of the input/output pins unique to microcontrollers:



The following are some of the capabilities of 8051 microcontroller.

* Internal ROM and RAM
* I/O ports with programmable pins
* Timers and counters
* Serial data communication

The 8051 architecture consists of these specific features:

* + - 16 bit PC &data pointer (DPTR)
    - 8 bit program status word (PSW)
    - 8 bit stack pointer (SP)
    - Internal ROM 4k
    - Internal RAM of 128 bytes.
    - 4 register banks, each containing 8 registers
    - 80 bits of general purpose data memory
    - 32 input/output pins arranged as four 8 bit ports: P0-P3

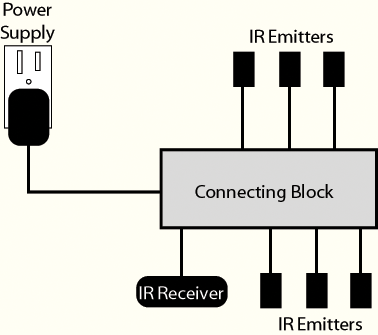
Two 16 bit timer/counters: T0-T1Two external and three internal interrupt sources Oscillator and clock circuits

IR REMOTE CONTROL THEORY-:

The cheapest way to remotely control a device within a visible range is via Infra-Red light. Almost all audio and video equipment can be controlled this way nowadays. Due to this wide spread use the required components are quite cheap, thus making it ideal for us hobbyists to use IR control for our own projects.

This part of my knowledge base will explain the theory of operation of IR remote control, and some of the protocols that are in use in consumer electronics.

BLOCK DIAGRAM-:



CONCLUSION-:

This concludes the theory of operation for IR remote control systems intended for use in consumer electronics. I realize that other ways exist to implement IR control, but I will limit myself to the description above. One of the issues not covered here is security. Security is of no importance if I want to control my VCR or TV set. But when it comes to opening doors or cars it literally becomes a 'key' feature! Maybe I will cover this issue later, but not for now.

This page only described the basic theory of operation of IR remote control. It did not describe the protocols that are involved in communication between transmitter and receiver. Many protocols are designed by different manufacturers.

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