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IR Remote Control Extension (Room-to-Room)

This little circuit will help you if you have eg. two TV sets in different rooms, but just one Satellite TV Receiver or VCR or any other similar combination.

You could have a Satellite Receiver connected via UHF to the TV set in one room and via SCART cable to the TV set in the other room. This way someone could watch eg. terrestrial television programme, while you in the other room watch satellite programme or vice versa. But, when you want to change the channel, you have to go to the room in which the Satellite Receiver is, because remote control won't work through the walls.

What this circuit does is to receive the signal from your remote controller and transmit it over two wires to the infra-red LED in the other room. If you point that LED to your satellite receiver, the receiver will take commands from your remote controller thus giving you the ability to control it from the other room.
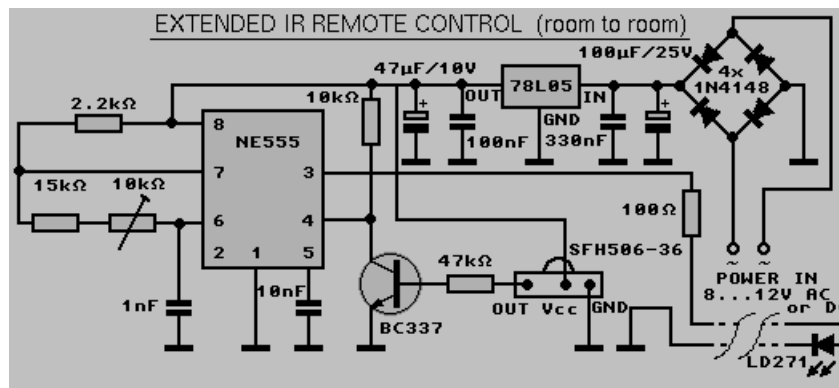
Basically, this circuit consists of a IR sensor IC, 28kHz to 44kHz oscillator and an IR LED. IR sensor IC (SFH506, TFMS5360) receives the signal from your remote controller. t is very sensitive, it will receive the signal from remote controller even if it is turned away from the sensor and a few meters away.

To send a command, remote controller sends a series of pulses of IR light modulated with 36kHz (usually, but some brands may be using 38kHz, 40kHz or some other frequency). The sensor IC receives this and strips the 36kHz modulation, putting a received series of pulses on it's output. These are inverted, ie. logic "0" for the duration of pulse, and logic "1" for pauses between pulses, so a transistor is used to invert the signal back, which is then taken to the enable input of NE555 connected as an oscillator at around 36kHz. At the output of NE555 there is a 36kHz burst for every pulse, and that is exactly what IR remote controller was giving out. This signal is then taken over two wires to the infra-red light emitting diode in the vicinity of the satellite receiver in the other room.

All this had to be done in order to filter out the noise and interference from ambient light changes, 50 Hz from mains operated lights and other things, so the simple photo transistor at one end and IR LED at the other end couldn't really be used.

As I've already said, not all brands of remote control work at 36kHz, so you may have to make some changes and adjustments. First, you have to get the right sensor IC. SFH506-36 is for 36kHz, SFH506-38 is for 38kHz and so on. Last two digits define the operating frequency. The other thing is trimmer pot. It can be set for frequency between 28kHz and 44kHz. For 36kHz it should be in the middle position (or if you have a frequency meter you could disconnect the collector of the transistor and measure the output frequency at pin 3 of NE555). But even if it is off
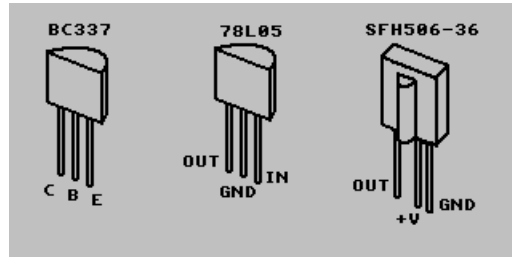
Projects list:

- IR Remote Control Extension
- Sweeping LEDs
- ZX Spectrum 24 lines Input/Output Interface
- PS/2 Mouse to Amiga Converter V1.0
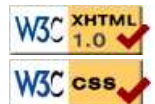
the correct frequency, it will still work although with more or less shortenned operating range (you will have to hold your remote controller closer and pointed more directly to the sensor).

Instead of SFH506 you can use TFMS5360 which is pin compatible to SFH506, and there are other similar ICs. For the power supply it is best to use ready made mains adapter (wall wart) which outputs 6 to 12V either AC or DC. You can connect it regardless of polarity.

Pinout:

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