

Simple Diseqc Decoder

Overview

The decoder is meant to interpret and decode the Diseqc control signals being sent by your satellite receiver to the switch, feed horn and positioner in your system.

It outputs to both an 2x16 LCD display and serially at 9K6 baud.

The circuit is designed to be powered by a satellite receiver when placed inline between the receiver and feed horn. It's current draw is minimal, around a couple milliamps.

There is only one control, a switch. When closed briefly, it starts or stops the decoding.

The cursor will disappear when stopped and reappear when started again.

Holding the switch for a couple of seconds will clear the display. Default is ON.

Construction

As seen in the photo on my web page, I built this operating circuit on a breadboard to demonstrate it's robustness and show how simple the circuit is. I recommend a solder construction for long term use however. The serial portion is to the right in the photo.

The only unusual part for some might be the 2.2 uH inductor. The value of this part isn't real critical, it's purpose is to act as a choke to the satellite TV signal (950 - 1450 MHz) and still pass DC and the 22 KHz Diseqc signal. By calculating the inductive reactance at the two frequencies, we can see how this works.

A 2.2 uH inductor has over 13k ohms impedance at 950 MHz and less than an ohm at 22KHz. Any near value inductor should work in this application.

The PIC 16F628A uses it's internal 4 MHz oscillator clock.

The voltage regulator can be any +5 volt 3 terminal type (i.e. 7805).

The serial output transistor is any general purpose NPN (i.e. 2N3904).

The switch should be a momentary closed type.

The display is the common 16x2 char LCD with parallel data inputs (i.e. not serial).

Contrast control is a 10k POT.

The coax portion is up to the builder. It can either be pass through with two jacks or a single jack using a coax tee connector to tap into the signal.

The builder has the option of including both serial output and the LCD display or just one or the other - depending on your needs. If the TTL serial circuit doesn't work with your computer, it can be replaced with a MAX232 or similar level shifting inverter.

I've included both the assembly code and the hex file for this device. Program the PIC16F628A with the hex code for operation. The assembly program is for those who want to see how it works.

Use

The display outputs the Diseqc control packets in hexadecimal mode.

The packets can vary in length from 2 - 6 bytes with most being 4 or 5 bytes long.

Use the Definition of Diseqc Bus Commands found in chapter 8 of the Diseqc Bus Functional Specification. Google it and download the 4.2 PDF version from Eutelsat.

Packet structure

A typical 4 byte packet has four elements:

The first byte is always the "EO" framing byte.

The second byte is the Address byte and it tells what device(s) the command is for.

The third byte is the Command byte. It is usually followed by one or two data byte(s),

If one or more duplicate packets are decoded, the display stays on the same line and inserts a star (*) at the next to last char. The cursor shows which line is newest.

This is to make a 2 line display more useful.

With a little practice, you'll hardly need the reference.

I'm developing a version that converts the hex output to English, but that probably won't be free :)

Good luck,

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