Subject: Re: IR Remote Control
Posted by Wayne Parham on Fri, 25 May 2012 23:49:32 GMT
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I actually wrote the firmware for the microcontroller on request of a friend and fellow kit maker. I realized there were a lot of amp kit makers and DIYers using remotes that were cheaply made. A motorized pot is not an improvement, except in terms of convenience. In most cases, they are a step back in sound quality because the pot used is el-cheapo. So this is a way to get convenience and high fidelity quality sound on a budget.

I am not planing to make boards and kits, because I want to leave that to the amp makers. However, it isn't hard at all to do. All the "circuitry" is in the firmware - the external circuit is literally just a three-wire interface between processor and RDAC, a single wire from the IR receiver and a power supply. It's super-simple to build one of these things. More wiring for the audio lines than anything else.

So you can wire one up with point to point wiring in minutes. You'll spend more time making the box and hooking up the RCA connectors than you will building the circuit. Most times, you'll want some nice relays for a switcher - to switch sources - and that's a little more circuitry, but still easy, just a garden variety 2N2222 transistor and a relay. Probably want some LEDs too, one for power, maybe one on each source line (same one that is connected to the relay/transistor) to show which source is selected.

Power supply is split, +/-2.5v. Easy enough to do with a couple of LM317/LM337 regulators. The schematic below shows a supply that is probably overkill, having cascaded regulators (7805/7905 followed by LM337/LM317) for extra noise immunity. This level of regulation rivals battery power for noise rejection.

But a complex supply isn't really needed. It could even be done with 1N5222 zeners in series with resistors on each end. The center is ground, and zeners on each side give +/-2.5v. Resistors of appropriate values to limit current, e.g. 22 ohms per side for a 12v supply. So, for example, if you have a 12v DC supply, hook one side of a 22 ohm, 10 watt resistor to the 12v (+) line, the other size to the cathode (band) of an 1N5222 zener, then connect the anode of that first zener to the cathode of a second 1N5222, then the anode of the second zener goes to a second 22 ohm, 10 watt resistor, and finally the other side of that second resistor goes to the (-) line of the 12v supply. Put 10uF capacitors across the zeners, and they provide the +/-2.5v across them. The connection between the zeners is ground, and the connection between the zeners and their resistors is the +/-2.5 outputs.

Use the split supply only to power up the processor and RDAC chips. Wire the relays and any indicator LEDs directly to the 12v supply. They're controlled by outputs from the processor, but their power comes from the 12v line. That limits the current requirements through the zeners and keeps 'em constant.

I like using a stereo VU meter hooked to a couple of the unused RDACs to give a visual indication of the volume setting for each channel. There are six RDACs and only two are needed for the audio signal, so two of the others can be used to drive a volume display. Just wire it as a voltage

divider on the power supply, so the wiper provides a voltage proprtional to the volume setting. A schematic for a simple indicator using an LM3916 is shown below. Gotta use blue LEDs, of course.

Remote Control Module Application Notes
Remote Control Circuitry and Assembly