Intellivision TV POWWW Replica
Build Instructions

decle 2021-01-05

Introduction

This document describes how to build a replica TV POWWW voice activated controller for your Intellivision. Because this interface connects to an Intellivision controller port it is much easier to use with the Intellivision 2, Sears Super Video Arcade or an Intellivision 1 with an ECS as all of these can connect controllers using a 9 pin Atari style connector. Unfortunately the stock Intellivision 1 and its clones like the Tandyvision and Super Pro systems have internal connectors, which makes hooking the circuit up a pain.

The circuit operates by closing a switch, effectively pressing a controller action button for about 0.5 sec whenever the volume of sound is above a threshold. If you have an LTO Flash or similar the circuit can be used with the TV POWWW replica ROM I have written. Alternatively, providing you're not trying to use it with an Inty 1 and ECS, Mattel's Sharp Shot will also work.

The TV POWWW interface is based on a simple commercial electronics kit and should be pretty easy for people to put together who have done some basic electronics and soldering. It should be possible to build it for less than $20 from items sourced from EBay.

I'd advise you to have at least a quick skim of the instructions below before starting. If you have problems please take a photo of both sides of the board as you have it and send it to me (decle) as a PM on AtariAge and I'll try to help you out.

Materials

The full set of materials is:
- 1x ICSK050A clap switch kit
- 1x Atari style DE9 female joystick connector
- 1x Triple AA battery holder with leads
- ~30cm of thin multicore wire

Whilst the style of connector shown here is the one I used, it is only *just* suitable as the metal connector only just protrudes far enough to engage with the recessed ports on the Intellivision.

UPDATE: I have found that this type of connector will not work with an ECS (and possibly the Intellivision II - I don't have one to test) as the controller ports are even more heavily recessed than the Super Video Arcade. Instead, Genesis / Megadrive extension cables make use of a thinner moulded plug that does fit both the SVA and ECS without issue. However, these tend to have very fine inner cores which makes them very fragile. So if you cut the cable in half to connect it to the PCB I don't know how robust they will be. I have investigated the possibility of using the cable off an Atari 2600 joystick, however, these do not connect pins 5 and 7 and so are not suitable.

At present the best option seems to be to connect a DB9 male plug to the circuit in a robust way, as described below, and then use a Genesis extension to actually connect it to the Intellivision. Whilst it would be possible to lay out a new PCB that integrates a DB9 male connector directly, I suspect demand probably doesn't justify it.

Build

The voice activation circuit is based on a commercial ICSK050A clap switch kit that can be obtained from EBay. The full circuit of the switch is shown below.
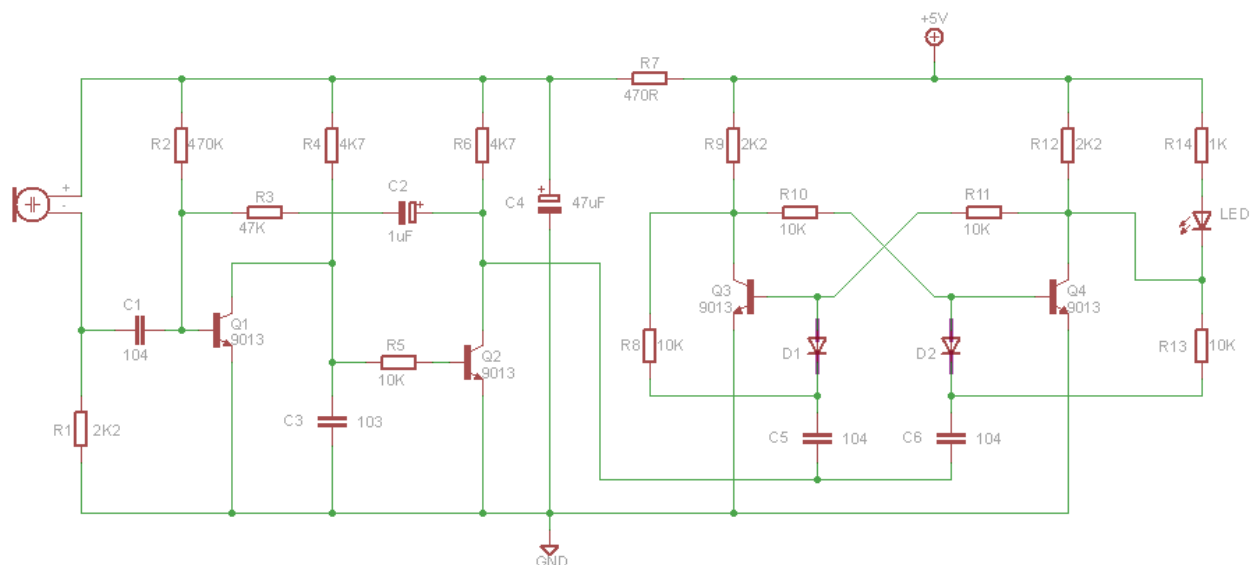
Don't be put off by this. We only need to use the left half of the circuit and the LED. So the circuit we will actually build simplifies to this:
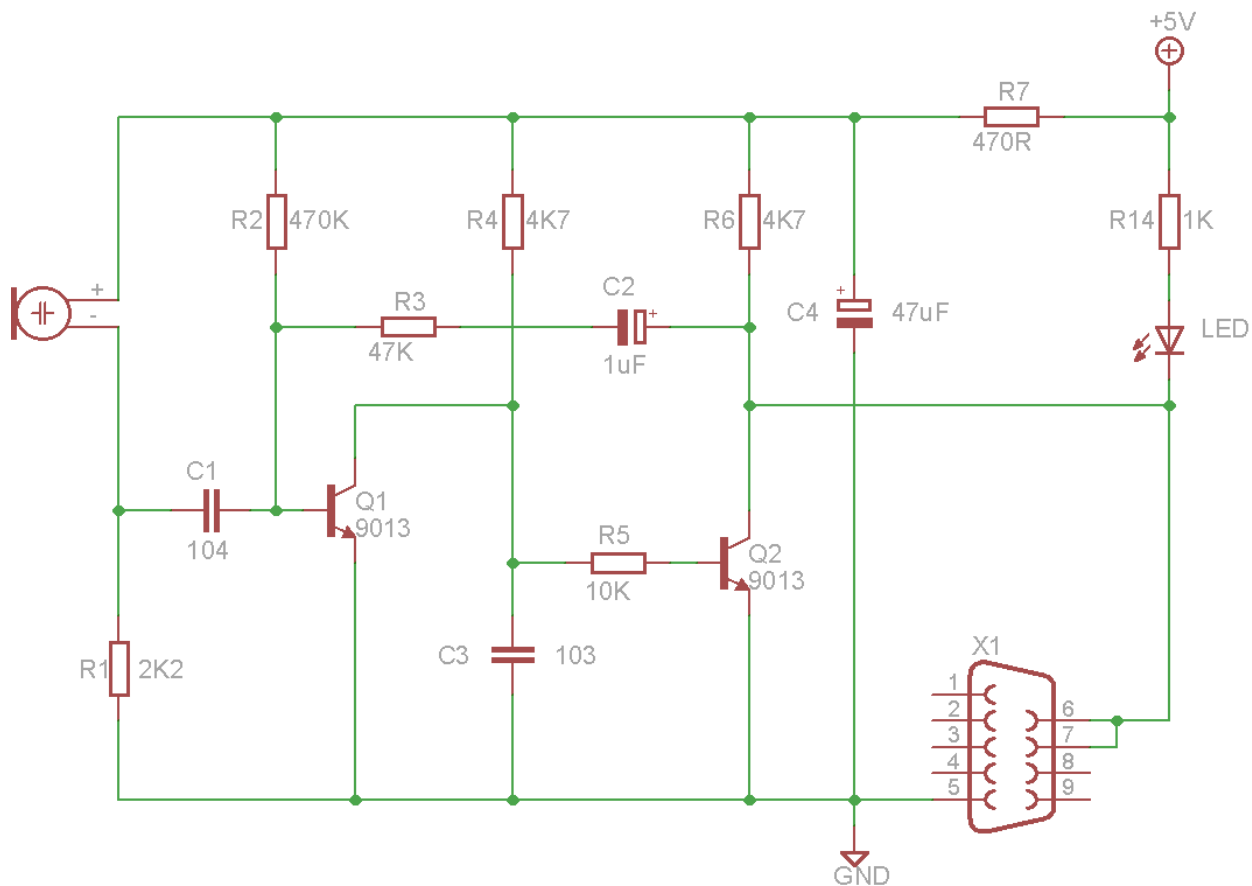
Providing you can read the symbols on this second diagram, know how to find the values of simple components and orient them correctly it's pretty simple. Here is an image of the complete circuit, notice how only the left half of the board is populated, with the exception of the LED and R14.
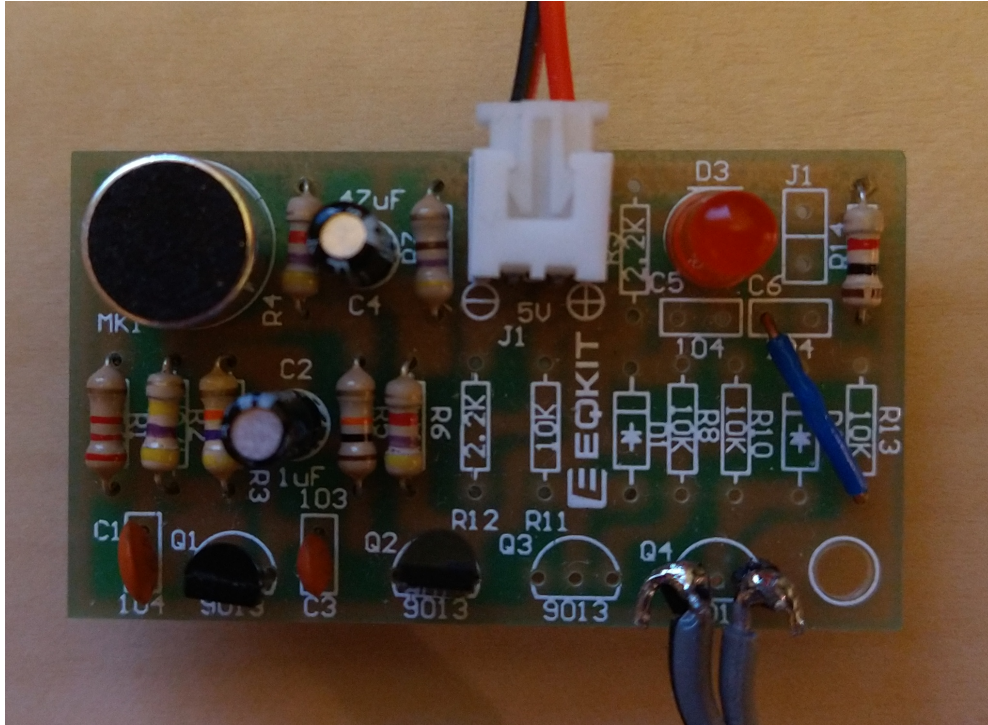
As always it's easiest to work from the flattest components to the tallest. So…

- Populate the resistors R1-R7 and R14
- Then the ceramic capacitors C1 and C3
- Transistors Q1 and Q2 (the silk screen on the PCB shows the orientation of the flat on the can)
- Electrolytic capacitors C2 and C4 (taking care to get the polarity correct)
- LED (again polarity is important)
- The power connector J1
- The mic - I found this was the only tricky bit, the polarity of the mic is important and not obvious. However, the leads on the base are offset and the orientation can be inferred from the PCB silk screen

Next we need to add a hack wire to connect the collector of Q2 to the cathode of the LED. We add a wire from the left terminal of C6 to the bottom terminal of R13 (see blue wire on the right of the image above).

Then wire up our controller DE9 connector. We need to connect pins 6 and 7 together and then hook up a wire to each of pin 5 and the combined pin 6 and 7. These two wires are the only connection to the Intellivision.

Next we connect the other end of the controller wires to the PCB. The wire connected to controller pin 5 is GND and connects to where the emitter of Q4 would normally go (left hand terminal). The second controller wire (connected to pins 6 & 7 of the controller) is the connection required to activate the bottom right action button. It connects to where the collector of Q4 would normally be (right hand terminal).

Again looking at the image of the complete board above, notice how the cable going to the controller connector (bottom) links to the collector (right - pin 6 & 7 on the Inty) and emitter (left, pin 5, GND). Because the wire I had was a bit chunky I used a couple of PCB pins to make the connection with the pads on the reverse of the board and then soldered the wire to the other side of the pins on the component side as you can see here.

The last thing that is required is to connect your battery box up to the power lead and put in three AA batteries and you're good to go.

Testing

It is possible to test the circuit without it connected to the Inty. Just power it up using the batteries. The LED should come on for about half a second if you click your fingers next to the mic.

If it works OK, then hook it up to the controller port on your Inty, slap in Sharp Shot or TV POWWW (remember, to play TV POWWW you will need an LTO Flash or similar RAM cart) and give it a go!

If this doesn't work check everything, *then check it again.* :-)

As I said earlier, if you have any problems take photos of the top and bottom of the board and the inside of your connector as you have them and contact me through AtariAge using a PM.

Thanks and have fun!

decle