APRS Build Day

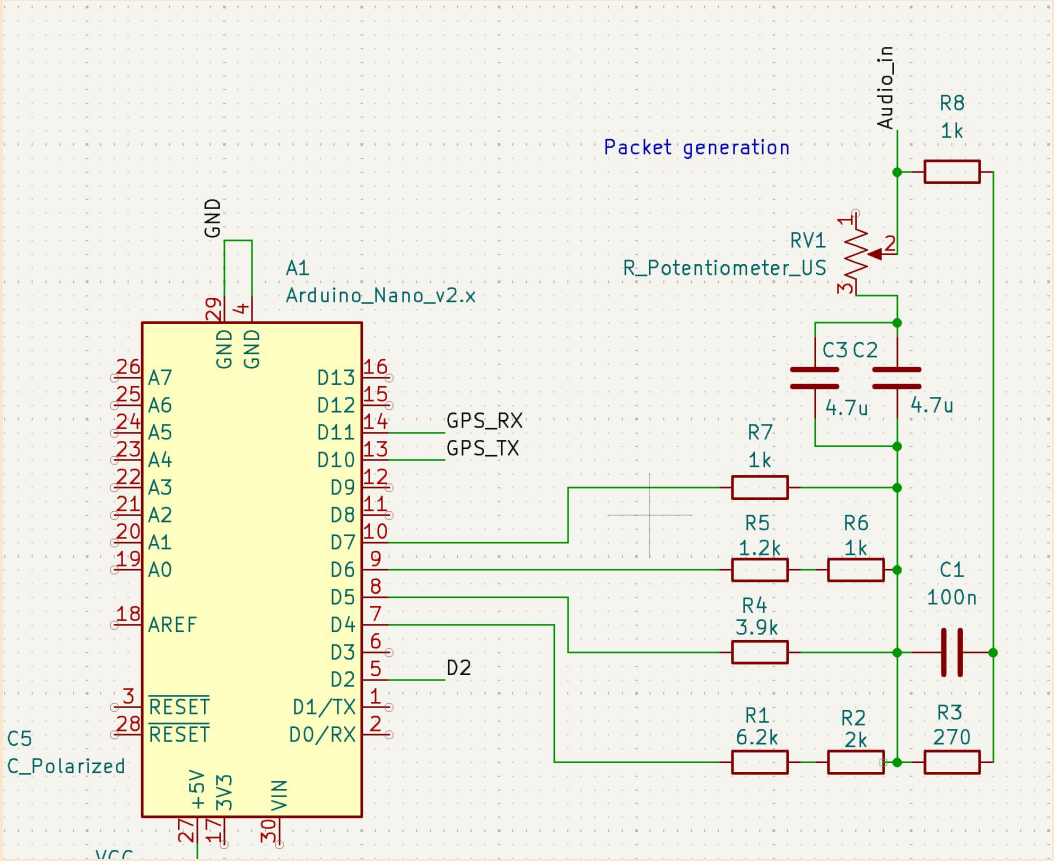
WVU ARC Build Day Committee: KE8TJE, N3AMK, WV8RQW

What are we building

- We are building a APRS Tracker/Beacon
- This can only generate AFSK, it needs to be plugged into a radio
- This make accessing APRS easy for a casual user - (a new ham)
- Build day goals:
    - Teach you new skills
    - Let you test the waters of homebrew/DIY electronics

A bit of electronics

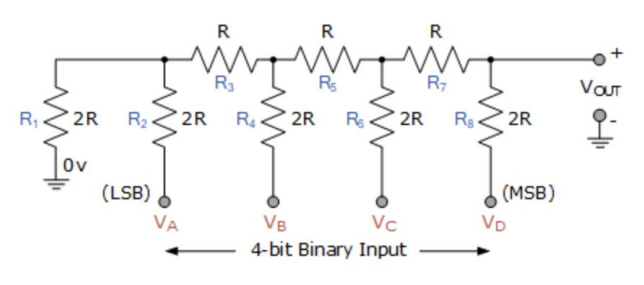
- Electrical engineers + extras in the room can you'll tell me how this works ?

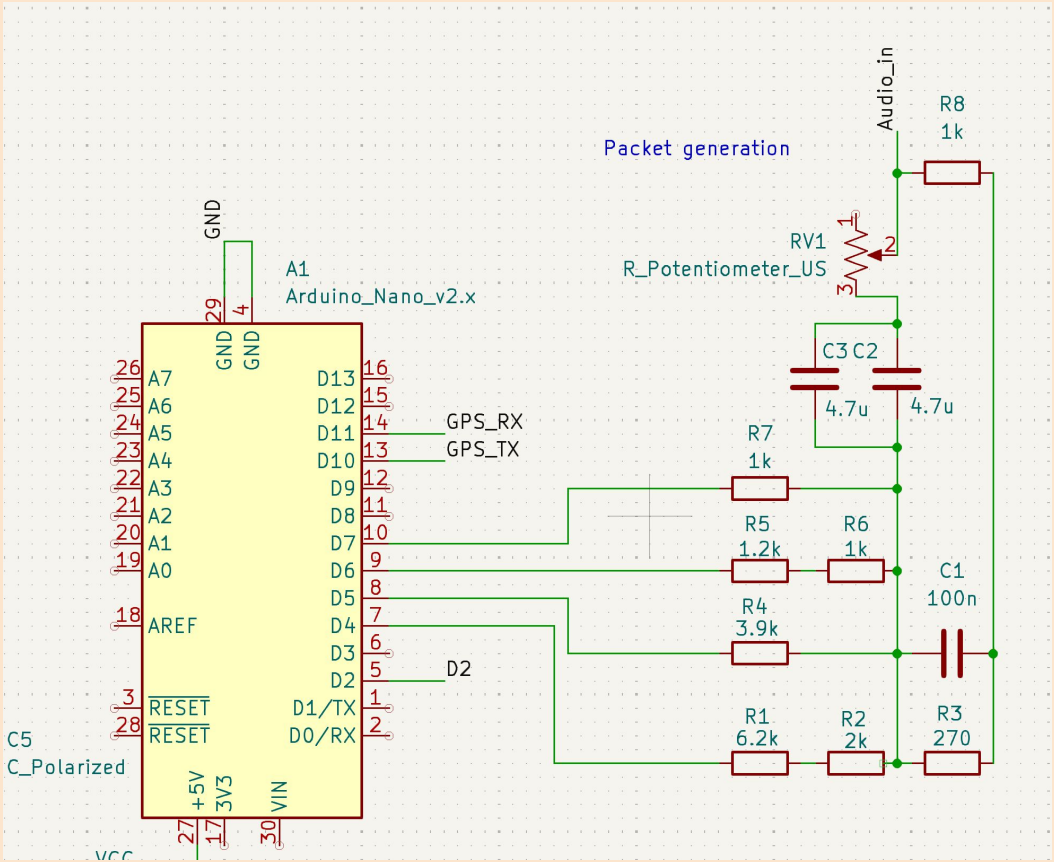


KE8TJE

A bit of electronics

- This is a simple DAC
- Using a ladder circuit
  - And a low pass filter
  - Once you build it you can look at the signal at each level and see what happens





KE8TJE

APRS - is an AFSK mode

- Fancy way of saying we have only two tones
  - 1200 and 2400 Hz that's all we need to generate
  - An arduino runs at 20 MHz its more than capable of generating the signals we would need
- If you want to look in to this, Once you have completed the build probe the signal with an oscilloscope.
  - Ask either the staff and some of us here should be able get it setup

KE8TJE

This is customizable - Some ideas

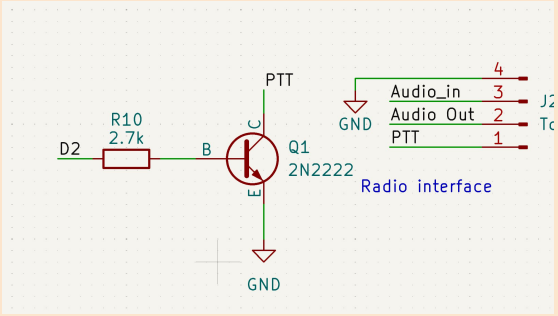
- Mount it in your car with a HT put an external GPS and 2m antenna
- This can be programmed to send telemetry:
  - you can evaluate the battery life of HTs
  - Make a small weather station
    - Put a BMP280 and you can make it a weather reporting system
  - Send other telemetry data from other projects
- This can be powered with a single li-ion battery and a couple of components to be a stand alone tracker
- This has a GPS, you could use that for other projects, you can convert this in to a WSPR beacon with some additional hardware
- Hope it will be an endless platform for DIY ham radio digital modes

KE8TJE

Minor correction in the schematic

For the PTT I have indicated a 2N222 NPN transistor. During testing we found that this has a hard time letting go of the PTT.

A ferite on the audio cable might solve it.



Current solution we change it to a BS170 MOSFET

Pin out luckily works the same way so just replace it and call it good

KE8TJE

Acknowledgement and thank

- The development some part of the build was funded under a grant from NASA West Virginia Space Grant Consortium for STEM outreach and popularization
- Open source hardware and software project
- Support open science / open hardware
- Aidan and Reily for organizing the logistics

KE8TJE

Soldering Basics

We can ask the HUB to do it if needed

Other information