# Flight Planning Checklist

* Select Date and Launch Time
  + Date: 2 / 2 / 2021
  + Time: 9:00 AM CST
* Weather Conditions (https://www.wunderground.com/forecast/us/al/auburn/32.62,-85.49)
  + Cloud cover < 50% : 4 %
  + Rain < 30% : 0 %
  + Jet Stream < 100 knots: 80 knots (https://weatherstreet.com/models/gfs-jetstream-wind-forecast.php)
* Calculate Balloon Dynamics
  + Payload mass: 1250 g
  + Balloon mass: 600 g
  + Positive lift: 1000 g (<http://tools.highaltitudescience.com/>)
  + Total lift: 2850 g
  + Required helium: 102.45 cu-f (<http://tools.highaltitudescience.com/>)
  + Ascent Rate: 5.1 m/s (<http://tools.highaltitudescience.com/>)
  + Descent Rate: 7.1 m/s (https://www.highaltitudescience.com/products/0-9-m-parachute)
  + Burst Altitude: 26390 m (https://predict.habhub.org/)
* Launch and Landing Location
  + Launch Address

Street: 721 S Broadnax St

City: Dadeville State: AL Zip: 36853

Lat: 32.82290091824284, Lon: -85.7607542402061 Elev: 218m

* + - Outside of restricted, Class B,C,D and E aerospace (https://skyvector.com/)
  + Predict landing zone (https://predict.habhub.org/)

Lat: 31.4915 Lon: -84.1975 Elev: 57m

* + - Outside of restricted, Class B,C,D and E aerospace (https://skyvector.com/)
* Flight Dynamics
  + Flight Time: 1 hrs, 56 min Landing Time: 10:56 AM
  + Total Distance: 130 mi
  + Driving distance (Launch to Recovery): 122 mi, Driving time: 2 hrs, 23 min
  + Driving distance (Round Trip): 291 mi, Driving time: 5 hrs, 35 min
* File NOTEM: (<http://blogs.und.edu/jdosas/wp-content/uploads/sites/108/2017/12/Instructions-Filing-a-NOTAM.pdf>)
  + Lat: 32° 49' 22.4436" Lon: -85° 45' 38.7144"
  + NOTEM Number: TGE02/017
  + Filed at 11:30 am on 2/1

# Pre-Packing Checklist

* Payload is ready
* Balloon is prepared
* String is tied
* Vehicle gas tank is full

# Departure Checklist

* Packed the following:
  + - Balloon
    - Payload
    - Helium tank and inflator
    - Extra batteries
    - Toolbox
    - Wireless router
    - APRS receiver

# Pre-Flight Checklist

* Payload Preparation
* Identify tall obstacles: light posts, power lines, trees
* Identify wind direction (if applicable)
* Lay down tarp/blanket in location to maximize balloon travel distance to tall objects
* Setup router
* Plug-in battery
* Connect via ssh, start ROS, verify sensors are working
* Calibrate IMUs (take all items out of pocket)
* Verify Spot3 is tracking
* Verify APRS signal is being transmitted via Direwolf
* Start ROS bag
* Balloon inflation
* Safety rope attached to payload and balloon from tank
* Balloon inflated to provide \_\_\_\_\_\_ g lifting force and tied off
* Take pictures of balloon inflation process
* Launch balloon
* Disengage safety rope from balloon
* Disengage safety rope from payload
* Record launch time \_\_\_\_:\_\_\_\_\_ \_\_\_\_\_
* Take video of launch process

# Post-Flight Checklist

* Upon Discovery of Payload
* Take picture of payload before touching and moving it
* Disconnect battery
* Record landing site: Lat: \_\_\_\_\_\_\_\_\_\_\_ Lon: \_\_\_\_\_\_\_\_\_\_\_ Elev: \_\_\_\_\_\_\_\_\_\_
* Record recovery time \_\_\_\_:\_\_\_\_\_ \_\_\_\_\_