

**Date:** 8/4/19

**Location:** Argonia, KS (August Fun Fly)

**Rocket:** Mach Wave II Stage

**Motors:** CTI J760WT to Aerotech H73J

**Weight:** 13.7 lbs

**Weather:** sun and clouds, <8mph winds, 90°F

**Launch:** 12:57 (17:57 UTC)

**Avionics:**

Altimeter	Booster/Sustainer	Drogue	Main	Pyro/AUX
TeleMega S/N 4324	Sustainer (primary)	Apogee	800	Pyro A: T+3s, <18°, 400ft AGL
EasyMini S/N 4686	Sustainer (secondary)	Apogee +2	500	
TeleMetrum S/N 5099	Booster (primary)	Apogee		
RRC3	Booster (secondary)	Apogee +2		AUX: T+1.8s, 100ft AGL launch trigger
Jolly Logic CR	Booster (parachute)		500	

**Pre-flight Prep:** Fog persisted for the first 3 hours of the 8-2 waiver. Dew was really bad in the morning, fortunately all avbays were stored inside the vehicle overnight. Rocket was 90% prepared the evening before on the field, including motor assembly. Only the booster was left to be finished due to arming the Jolly Logic Chute Release. Sustainer rivets can't go in if the threaded rods are located over the holes. Some duct tape peeled off the ejection charges. Not sure why, as this was a brand-new roll of Duck Tape brand tape.

**At the Pad:** Screw (sustainer) and rotary (booster) switches made arming electronics vastly easier. This was the greatest improvement from the previous flight. Pad time was less than 5 minutes versus 15 or more from previously. Checklists barely used this time. Ladder not necessary.

**Flight:** J760WT lit immediately and flew straight up. No telemetry on the sustainer since I didn't check the "Age" on AltOS; I must have selected the same TeleDongle twice when plugging in the second. Sustainer ignition good, all parts came down gently downrange. Sam spotted the sustainer despite not having telemetry of any kind.

**Recovery:** No damage, both parts landed on the way to setting up our N5800 rocket.

**Comments from the field:**

1. More thrust was the way to go. Last attempt shouldn't have even happened.

**Flight Data:**

Altimeter	Max Height (ft)	Max GPS Height (ft)	Max Speed (ft/s)	Max Boost Accel (G)	Ascent Time (s)	Touchdown speed (ft/s)
TeleMega S/N 4324	5793	6089	412	13.8	19.1	14
EasyMini S/N 4556	5880		365	9.67	20	13
TeleMetrum S/N 5099	3274	3307	407	13.6	14	30
RRC3	3218		545		13.8	

**Data Analysis:**

1. Jolly Logic was set for 800 feet, but TeleMetrum data shows slowdown occurred at 200 feet.
2. H73J took about 1 second to come up to pressure after receiving ignition signal.
3. TeleMega tilt angle was  $<3^\circ$  through sustainer ignition, even 17s into flight, tilt angle was  $17^\circ$ .

**Commentary:**

1. 9V RRC3 battery came loose at drogue deployment of booster.
2. Super great flight. No stress in prep, weather cooperated, all went well.
3. Drag separation will continue to be the way to go.
4. 54mm CTI casing didn't prevent drogue deployment like it did on our Argonia Cup rocket.

**Future Actions:**

1. Arm Jolly Logic for 1000 feet.
2. Secure RRC3 9V battery with a zip tie
3. Adjust conduit sustainer ignition wire system
4. Check "Age" on telemetry prior to turning in flight card.
5. Check threaded rod location over rivet holes.
6. Increase sustainer ignition time to 5s after launch if wind permits.
7. Recalibrate TeleMega gyros (it was on the pad thinking it was already tilted  $1.8^\circ$ )
8. Investigate gorilla tape or other for black powder charges
9. Set sustainer main deploy to 500 feet and 400 feet (800 was way too high)
10. No need to monitor flight at LCO table. Keep ground station near camp with the homies.
11. Record landscape of the launch yourself since you'll watch that over and over.









