



# Great Plains Super Launch

## Edge of Space Sciences



**June 14-18, 2017**

**Rev: Rev 2**



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# **GPSL Quick Reference Sheet**

## **Trip Out**

Time Leaving Limon on Wednesday: 08:00 AM

Mileage from Limon to Hutchinson: 378 miles

Address and Lat/Long of Days Inn Hutchinson:

1420 N. Lorraine, Hutchinson, KS 67501 Phone: (620) 665-3700

Lat/Long: N38.06990 deg., W97.90357 deg. (or N38 deg. 4.194 min., W97 deg. 54.21 min)

## **Frequencies:**

Breakfast Rendezvous Repeater Frequencies

- 146.64 MHz - Denver Relay League
- 448.450 MHz - Pikes Peak FM Association

En Route:

- Simplex – 446.100 MHz
- APRS – 144.39 MHz (with –6 SSID please)

<b>Frequency</b>	<b>Tone</b>	<b>Location</b>
147.12	None	Located in Elmer, KS. About 5 miles south of Hutch. Primary talk-in/call-in repeater for GPSL.
145.11	103.5	Newton, KS. About 32 miles east of Hutch
146.61	103.5	Newton, KS. About 32 miles east of Hutch
443.100	None	Newton, KS.
443.850	None	McPherson, KS
146.94	None	Wichita, KS. About 42 miles SE of Hutch

EOSS Flight and Track and Recovery (finalized Friday night before the flight):

- Launch Site Simplex – 446.050 MHz
- T&R Simplex – 446.100 MHz
- Area Repeater (we'll choose one of the several near Hutchinson)
- EOSS Balloon APRS – 145.57 MHz

## **Grid**

Days Inn: Lat/Long: N38.06990 deg., W97.79036 deg. (or N38 deg 4.194 min., W97 deg. 54.21 min.)

Grid Coordinates: XX, YY (Assign at Friday preflight briefing)

## **Launch Site**

Location: To be set at Friday preflight briefing

Lat/Long and Grid: Lat/long of possible sites on Page 10.

Predicted Landing Location

Friday Night: Grid: X\_\_\_\_\_, Y\_\_\_\_\_, Lat/Long\_\_\_\_\_

Saturday Morning: Grid: X\_\_\_\_\_, Y\_\_\_\_\_, Lat/Long\_\_\_\_\_

# EOSS at GPSL 2017

## **Our Host**

Zack Clobes, WØZC of Project Traveler is our host (785 230-6866h).

- Project Traveler is a Hutchinson-based amateur high altitude balloon group. They have been flying since 1999, but have not been active in the last few of years.

<http://projecttraveler.org/traveler/>

## **Location**

The technical session will be held at the Kansas Cosmosphere and Space Center, which is located at

1100 North Plum

Hutchinson, Kansas 67501

(800)397-0330

<http://www.cosmo.org>

## **GPSL Website**

<http://superlaunch.org/>

## **EOSS Attendees**

Ronald Cox, W9KFB

John Dinneen, KCØL

Marty Griffin, WAØGEH

Sharon Griffin

Nick Hanks, NØLP

Jim Langsted, KCØRPS

Dave Lanning, KDØSEM

Tom Londrigan, KE7KCK

Kevin Karanja, KDØPWG

Jen Cameron

Chris Kregel, KBØYRZ

Steve Meer, KØSCC

Larry Noble, NØNDM

Mark Patton, KCØD

Paula Patton

Rob Wright, KC0UUO (Friday evening & Saturday)

## **Lodging**

This is our motel for GPSL this year:

Days Inn Hutchinson  
1420 N. Lorraine St.  
Hutchinson, KS 67501  
(620) 665-3700

The hotel has high speed Internet access and offers a complimentary hot breakfast.

Lat/Long: N38.06990 deg., W97. 90357 deg. (or N38 deg. 4.194 min., W97 deg. 54.21 min.)

## **Directions and Breakfast on Thursday, June 14th**

### **Breakfast**

We'll gather in Limon at the McDonalds for breakfast and to form our "convoy." Be in your car and ready to roll at 8:00 AM. Also have your gas tank full so we can get a ways into Kansas before our first gas/potty stop.

### **On to Hutchinson**

From Limon, CO it's 379 miles to the Days Inn in Hutchinson. We'll be using a scenic cutoff from I-70 down to Hutchinson (same route we used in 2006, 10 & 14). The mileage is slightly less than on the Interstates, but the time's about the same.

*Our Route:* I-70 east into Kansas to I-70 exit 219 (Rt. 14 Ellsworth). Then south on Rt. 14, to Rt. 96, east though Nickerson. As we near Hutch we'll take the diagonal short cut, Nickerson Blvd. into Hutch. Then about Plum St. we'll turn left and go north to 11<sup>th</sup> Ave. Then east on 11<sup>th</sup> Ave. to Lorraine St. and then north about 0.3 mile to the Days Inn on the right.

### ***Driving Time:***

- 378 mi @ 66 mph = 5.75 hours (accounting for a speed limit in Colorado of 75 mph and Kansas of 70 mph on the interstate and 60 mph on Rt. 14 & 96.).
- Lunch and gas 1.5 hour.
- One additional gas/rest stop at 0.5 hr.
- Total:  $5.75 + 1.5 + 0.5 = 7.75$  hr.
- For 08:00 AM departure from Limon, we should arrive at the motel at about 5:00 PM (Central DST).

## **Time Zone Changes/Sunrise & Sunset**

- On the way to Hutchinson the time zone changes from Mountain Time to Central Time in Kansas at the Sherman-Thomas county lines on I-70. That's at 101 degrees 23.472 minutes West longitude (101.39120 W).
- Sun times for 14 June for Hutchinson, KS.
  - Sunrise: 6:08 a.m.
  - Sun transit: 1:32 p.m. (Time the sun is at its highest point in the sky)
  - Sunset: 8:56 p.m.

## **Tactical Call Signs**

<b>Tactical</b>	<b>Call Sign</b>	<b>Group</b>
Alpha	WAØGEH (AEØSS on Saturday)	Marty & Sharon
Bravo	NØNDM	Larry, Chris & Jen
Charlie	KDØSEM	Dave
Delta	KØSCC	Steve & Nick
Echo	KCØL	John
Foxtrot	KCØD	Mark & Paula
Golf	KCØRPS	Jim
Hotel	KCØUUO	Rob
India	KE7KCK	Tom

## **Mission Coordinator and Leads/Top Level Responsibilities**

Mission Coordinator – N. Hanks (Mission Plan (this booklet) & host coordination)

Payload Preparation – S. Meer/M. Patton/T. Londrigan

Flight Path Prediction/Weather Prediction – R. Collander

Launch Lead – L. Noble (Balloon fill & flight string setup; balloon, fill equipment, helium & tarps transportation)

Flight String Lead – S. Meer (Configure string on launch day, checkout modules, brief payload handlers and prepare flight string for launch, assist with launch, secure flight string at landing site & prepare for transportation back to Denver.)

Safety Lead/Checklist – J. Langsted

T & R Lead – M. Griffin (Alpha & preflight eyeball-net NCS.)

## Frequencies

### Breakfast Rendezvous Repeater and Simplex Frequencies

- 146.64 MHz - Denver Relay League
- 448.450 MHz - Pikes Peak FM Association
- 446.100 MHz - Simplex

### En Route:

- Simplex – 446.100 MHz
- APRS – 144.39 MHz (with –6 SSID please)

### Hutchinson, KS Area Repeaters

#### ***Repeater Listing***

<b>Frequency</b>	<b>Tone</b>	<b>Location</b>
147.12	None	Located in Elmer, KS. About 5 miles south of Hutch. <b>Primary talk-in/call-in repeater for GPSL.</b>
145.11	103.5	Newton, KS. About 32 miles east of Hutch
146.61	103.5	Newton, KS. About 32 miles east of Hutch
443.100	None	Newton, KS.
443.850	None	McPherson, KS
146.94	None	Wichita, KS. About 42 miles SE of Hutch

This is a good listing of Kansas repeaters: <http://www.ksrepeater.com/>. WAØGEH will choose some repeaters for the T&R when we have the flight path prediction and announce the choices at the Friday eyeball net. Marty put together a map of the locations of likely repeaters. It's on Page 18.

### EOSS Flight and Track and Recovery (finalized Friday night before the flight):

- Launch Site – 446.050 MHz
- T&R Simplex – 446.100 MHz
- Area Repeater (we'll choose one of the several near Hutch at the Friday "net.")
- EOSS Balloon APRSs - 144.36 MHz and 145.57 MHz
- Balloon DF Beacon and Cutdown – 144.95 MHz

A GPSL frequency plan is included at the end of this booklet.

## Agenda

<b>Wednesday, June 14 Initial Gathering, Drive and Check-In</b>		
<b>Time</b>	<b>Event</b>	<b>Location</b>
8:00 AM	Departure from McDonalds	Limon, CO
6:00 PM	Dinner in Hutchinson.	TBD

<b>Thursday, June 15 Visit to Salt Mine, Cosmosphere &amp; Training Center</b>		
<b>Time</b>	<b>Event/Presentation</b>	<b>Location</b>
As Desired	Breakfast	Motel
8:45 AM	Leave motel for Strataca Kansas Underground Salt Mine. Admission \$14. (Google: Kansas Underground Salt Mine)	3550 East Ave G Hutchinson, KS 67501 (620) 662-1425 Direction below

Around noon	Lunch	Group choice after tour
About 1:00	Visit to Kansas Cosmosphere and Space Center	1100 North Plum Hutchinson, 800.397.0330 Directions below
3:00	Tour of the Kansas Law Enforcement Training Center (This is a GPSL event.)	11009 S Hornet Rd, Hutchinson
6:00 PM	Dinner at Anchor Inn (This is a GPSL function.)	128 S Main St. Hutchinson Directions below

Directions to Kansas Strataca Underground Salt Mine from Days Inn (about 3.8 miles)

- Turn left out of motel parking lot and go south on Lorraine
- After 0.7 mile turn left onto E. 4<sup>th</sup> Ave, then immediately turn right (south) onto SR-61
- Turn left (east) on E. Avenue G
- In two miles turn into the salt mine parking lot.

Directions to Cosmosphere from salt mine (4.6 miles)

- Go west on E. Avenue G back to SR-61
- Turn right and go north to E. 4<sup>th</sup> Ave.
- Turn left on E. 4<sup>th</sup> Ave. and go west 1.1 miles to Plum St.
- Turn right and go north 0.6 mile to 11<sup>th</sup> Ave.
- Turn right and then left into the parking lot located west of the Cosmosphere.

Directions to Anchor Inn from Days Inn

- Turn left (south) out of parking lot and go south on Lorraine
- Turn right (west) onto E. 4<sup>th</sup> Ave
- Go 1.5 miles and turn left onto Main St.
- Go 0.5 miles to Anchor Inn on left

<b>Friday, June 16 Tech Sessions, Ladies Day, Friday Night "Net," Dinner</b>		
<b>Time</b>	<b>Event/Presentation</b>	<b>Location</b>
9:00	Ladies Day Gathering	Days Inn Lobby
9:00-9:15	Tech Session Opening and Introductions - Zack Clobes	Cosmosphere Conf Room Driving directions below
9:15-9:45	Using HAB in the STEM Classroom – Jim Langsted	“
9:45-10:15	Search and Recovery of EOSS-224 – Marty Griffin	“
10:15 – 10:30	Break	
10:30-11:30	Near Space Imaging – Paul Verhage	“
11:30-12:00	Developing an Extended Duration Stratospheric Balloon-based Research Program – Howard Brooks	“
12:00-1:00	Lunch (provided)	“
1:00-2:00	Solar Eclipse Demonstration in the Planetarium Brad Nuest	“
2:00-3:00	Circumnavigating the Globe with a Pico Balloon Bill Brown	“
3:00-3:15	Break	“



3:15-4:00	Comparison of Online Prediction Tools Jerry Gable	“
3:45-4:15	Round-Table Discussion of Eclipse Photography	
4:15 – 4:45	Fixed-wing Recovery System – Paul Kaup & Bill Brown	
4:30-5:00	Weather and Flight Planning Mark Conner	“
5:00–5:30	EOSS Eyeball Pre-flight Net – Marty Griffin	“
6:30	Dinner at Downtown Sampler	1 N Main St Ste 201 (above the First National Bank) Hutchinson, KS Driving directions below
After dinner	EOSS Equipment Setup & Checkout, Computer Setup	Days Inn Parking Lot

Directions to Downtown Sampler from Days Inn

- Turn left (south) out of parking lot and go south on Lorraine
- Turn right (west) onto E. 4<sup>th</sup> Ave
- Go 1.5 miles and turn left onto Main St.
- Go south about 1/3 miles. Building is on the right, but turn right on Sherman St.
- Drive into the covered parking garage on the west side of the building.
- Proceed to the top of the garage.
- The restaurant is just inside and to the left.

Directions to Cosmosphere from Days Inn

- Turn left out of Days Inn and go south on Lorraine St. 0.3 miles to E. 11<sup>th</sup> Ave.
- Turn right and go west 0.8 miles to the Cosmosphere parking lot on the right. (You’ll see the parking lot before you see the Cosmosphere building.)
- If you cross Plum St., you went too far.

<b>Saturday, June 17 Mass Ascent, Flight &amp; Recovery</b>		
<b>Time</b>	<b>Event</b>	<b>Location</b>
6:30am	Helium pickup, NØNDM, Launch Coordinator	
7:00 am	Launch prep and fill. We’re going to delay our launch a bit so we can take a look at the other groups’ payloads, launch prep and release techniques.	One of two sites (see Page 10.) Will be set at Friday preflight briefing.
8:00 am	Launch. There are nine groups flying balloons:	Same as above
?	Track and recovery, WA0GEH Alpha	Hopefully in KS
As desired	Lunch	Local Restaurant
6:30 pm	Dinner	Lone Star Steak House or ?

<b>Sunday, June 18 Alternate Launch Date and/or Return to Denver</b>		
<b>Time</b>	<b>Event</b>	<b>Location</b>
6:30am	Launch Site (TBA)	Flight String Prep & Fill
7:30am	Launch Site (TBA)	Balloon Launch
1:00pm?	Local Restaurant	Lunch
<b>OR</b>		
7:00 am	Days Inn	Breakfast
8:00 am	Leave for Denver	

## **Video**

There will be no live video in Hutch this year.

## **Meals**

### Breakfasts

A free continental breakfast is available at the Days Inn.

### Lunch on Thursday

Will come up with a place near the Cosmosphere.

### Lunch on Friday (Tech Session)

For lunch, snacks, and admission to the Cosmosphere is \$40 per person. If you didn't pay via PayPal, please register and pay first thing upon arriving at the Cosmosphere. We're planning on just the guys at the tech session with the all the ladies getting together for the day. Location of that is TBD.

### Dinners

Thursday and Friday evenings -- locations and directions in Agenda above.

Wednesday, Thursday and Saturday evenings – our call. Need to be aware there will maybe fifteen of us so we may need to consider going as two groups and/or splitting up in one place.

## **Grid**

We'll use the Days Inn parking lot as the grid reference point. It's at N38.06990 deg., W97.79036 deg. (or N38 deg. 4.194 min., W97 deg. 54.21 min.). The Alpha will assign the grid coordinates of using Days Inn as the reference point during our pre-flight briefing on Friday afternoon and in concert with Randy's flight prediction. See Page 19 if you need a refresher on putting a new grid reference point into TrackPoint.

## **GPSL Flight Predictions on the Web**

Randy's predictions are at <http://www.eoss.org/predict/>. This URL is also on the EOSS website.

## **Launch Sites**

Which launch location we'll use will be decided at the end of the tech session on Friday. The Hutchinson Airport is primary. (It's on the map on Page 17.) The backup location is the Newton

Airport just east of Newton, KS. See Page 19 if you need a refresher on putting a new launch location into TrackPoint.

A. Hutchinson Airport

N38 ° 3.84', W97° 51.90' (38.064,-97.865) @ 1542 ft.

B. Newton Airport

N38 ° 2.89', W097° 16.92' (38.048, -97.282) @ 1532 ft.

## **About Hutchinson**

Hutchinson is the largest city in and the county seat of Reno County, Kansas. It's located 39 miles northwest of Wichita, on the Arkansas River (yea, the same one that flows through Pueblo and Buena Vista). Hutchinson's nickname is *The Salt City* but is referred to locally as *Hutch*. The population estimate for 2012 was 41,962 based on the 2010 census. Every September Hutchinson hosts the Kansas State Fair, in March it hosts the National Junior College Athletic Association (NJCAA) Basketball Tournament, and in July the United States Specialty Sports Association's boy's baseball 16 & Under Baseball State Tournament, and the girls Fast Pitch 18 & Under World Series.

## **Climate**

Hutchinson averages 4.9 inches of rain in June. The average June high is around 87 degrees, and the average low is 62 degrees.

## **History**

The city of Hutchinson was founded in the year 1871, when Indian Agent C.C. Hutchinson contracted with the Santa Fe Railway to make a town at the railroad's crossing over the Arkansas River. The community was known to be called "Temperance City." Hutchinson was incorporated on August 15, 1872.

On January 17, 2001, 143 million cubic feet (4,000,000 m<sup>3</sup>) of compressed natural gas leaked from the nearby Yaggy storage field. It sank underground and then rose to the surface through old brine, or salt wells making around 15 gas blowholes. An explosion in the downtown area at 10:45 a.m. destroyed 2 businesses and damaged 26 others. An explosion the next day in a mobile-home park took the lives of two people. The Kansas National Guard was called in to help evacuate parts of the city because of the gas leaks, and a team of specialists looked over all the city for leaks after the event. These events were broadcast on nationally televised news stations across the country.

Hutchinson is home to the Prairie Dunes Country Club, a golf course frequently ranked among the best golf courses in the U.S., and has hosted several United States Golf Association national championship tournaments.

## **The Cosmosphere**

The Kansas Cosmosphere and Space Center in Hutchinson, Kansas, grew from a planetarium established on the State Fairgrounds in 1962. The 105,000 square foot facility now houses the largest collection of Russian space artifacts outside of Moscow, and the second largest collection of space artifacts in the world,



second only to the National Air and Space Museum.

The Cosmosphere has four venues - The Hall of Space Museum, The Justice Planetarium, The Carey Imax Dome Theatre, and Dr. Goddard's Lab, which is a live science presentation. The Cosmosphere also hosts a series of camps for children as young as those going into second grade, up to a camp designed for grandparents to attend with their grandchildren.

The only Smithsonian affiliated museum in Kansas, the Cosmosphere was voted one of the eight wonders of Kansas in a 2008 national poll.

Included in the Cosmosphere's collection are an SR-71 Blackbird, the Liberty Bell 7 spacecraft from Mercury 4, and the Odyssey command module from Apollo 13, as well as authentic Redstone and Titan II launch vehicles used in the Mercury and Gemini programs. Restored World War II V-1 and V-2 rockets are also on display. A prized item in the collection is a moon rock from the Apollo 11 mission, the first mission to reach the moon.

The Cosmosphere is the only museum in the world that has both an authentic restored V-1 flying bomb and an authentic restored V-2 rocket. It is also the only museum outside of Russia that has an authentic, flown Vostok capsule.

An interesting note about the Cosmosphere's collection is that nearly all of the vehicles, rockets, spacecraft, and spacesuits that you will see are either the real thing or something called a "Flight Ready Backup". A flight ready backup is identical, in all respects, to the item actually flown. If a problem is detected in a spacecraft, rocket, or suit before it is flown, the flight ready backup fills in on the mission for the damaged item. The only replicated items in the Cosmosphere are the model of "Glamorous Glennis," the Bell X-1 flown by Chuck Yeager, and the life-sized space shuttle replica that greets visitors.

The Cosmosphere museum begins with the earliest experiments in rocketry during the World War II era, explores through the "Space Race" and Cold War, and continues through the modern times with the Space Shuttle and International Space Station. The Cosmosphere is one of only three museums to display flown craft from Mercury, Gemini and Apollo missions.

Ref.: [http://en.wikipedia.org/wiki/Kansas\\_Cosmosphere\\_and\\_Space\\_Center](http://en.wikipedia.org/wiki/Kansas_Cosmosphere_and_Space_Center)

## **Hutchinson and Salt**

Salt is an abundant and valuable natural resource in Kansas. In addition to salt's well-known uses (such as table salt or road de-icing material), large caverns dissolved out of salt beds also are used to store natural gas, natural gas liquids (such as propane and butane), and other petroleum products.

Halite is the mineral name for salt. The chemical composition of halite is NaCl, or sodium chloride, which is the same as common table salt. Salt is a general term for naturally occurring sodium chloride. Rock salt is the term used for natural salt deposits composed of halite and other impurities, mainly thin beds of shale.

This is just a short write-up about Hutch and salt. Goggle "Kansas Salt" for more information.

## **About Kansas**

- Population: 2,907,289 (2016 US Census Estimate); 34th largest state
- Attained Statehood: January 29, 1861 (34<sup>th</sup> state)
- Origin of Name: Named after the Kansa tribe, who inhabited the area in earlier times. The tribe's name is often said to mean "people of the wind" or "people of the south wind", although this was probably not the term's original meaning.
- Nickname: Sunflower State
- Slogan: "There's No Place Like Home" (of the ruby slippers in The Wizard of Oz) and "Kansas: As big as you think"

- Capital: Topeka
- Largest City: Wichita

### Geography

Kansas is bordered by Nebraska on the north; Missouri on the east; Oklahoma on the south; and Colorado on the west. The state is divided up into 105 counties with 628 cities. It is located equidistant from the Pacific and the Atlantic oceans. The geographic center of the 48 contiguous states is located in Smith County near Lebanon, Kansas. Lebanon is located north of Russell, KS about 12 miles from the Nebraska state line. The geodetic center of North America was located in Osborne County until 1983. This spot was used until that date as the central reference point for all maps of North America produced by the U.S. government. The geographic center of Kansas is located in Barton County.

The western two thirds of the state, lying in the great central plain of the United States, has a generally flat or undulating surface. However, the eastern third has many hills and forests. The land displays a gradual slope up from east to west; its altitude above the sea ranges from 684 ft (208 m) along the Verdigris River at Coffeyville in Montgomery County, to 4,039 ft (1,231 m) at Mount Sunflower, one half mile from the Colorado border, in Wallace County. It is a popular belief that Kansas is the flattest state in the nation, reinforced by a well-known 2003 study stating that Kansas was indeed "flatter than a pancake." This has since been debunked, with most scientists ranking Kansas somewhere between 20th and 30th flattest state, depending on measurement method

The highest point in Kansas is Mount Sunflower, 4,039 ft. Located in Sherman County, it is less than 1/2 mile from the Colorado state border and close to the lowest point in Colorado. The state of Kansas gradually increases in elevation from the east to the west. As such, "Mount" Sunflower, while the highest point in the state in terms of elevation, is indistinguishable from the surrounding terrain. (On our trip to Hutchinson, when we enter Kansas, we'll be in Sherman County. Mount Sunflower is 21 miles south of I-70 at the KS border.) The lowest point in Kansas is the Verdigris River, 679 ft. at Coffeyville in Montgomery County, located on the Oklahoma state line in southeast Kansas.



***Mount Sunflower, Highest Point in Kansas***

### Notable Facts about Kansas

Kansas comprises 105 counties.

The four largest urban areas are, in descending order, Wichita, Overland Park, Kansas City, and Topeka.

The first European to set foot in present-day Kansas was Francisco Vázquez de Coronado, who explored the area in 1541. In 1803, most of modern Kansas was secured by the United States as part of the Louisiana Purchase. Southwest Kansas, however, was still a part of Spain, Mexico, and the Republic of Texas until the conclusion of the Mexican-American War in 1848. From 1812 to 1821, Kansas was part of the Missouri Territory.

The Santa Fe Trail traversed Kansas from 1821 to 1880, transporting manufactured goods from Missouri and silver and furs from Santa Fe, New Mexico. Wagon ruts from the trail are still visible in the prairie today.

Area (Land and Water): 82,277 square miles; 15th largest state

Some famous People from Kansas:

Amelia Earhart (aviation pioneer)

Carrie Nation (temperance activist)

Former president Dwight D. Eisenhower

Bob Dole and Alf Landon (former presidential candidates)

NASA astronauts Ronald Evans, Joe Engle, and Steve Hawley

Walter Chrysler of automotive fame

Clyde Cessna and Lloyd Stearman (aviation pioneers)

Jack Kilby (microchip inventor, The Nobel Prize Winner in Physics 2000)

George Washington Carver (educator and scientist)

Earl W. Sutherland, Jr. (The Nobel Prize Winner in Physiology or Medicine 1971)

Vernon L. Smith (The Nobel Prize Winner in Economics 2002)

General Richard Myers (Chairman, Joint Chiefs of Staff, 2001-05)

Robert Gates (United States Secretary of Defense December 2006 - Present)

Annette Bening (actress)

Dennis Hopper (actor)

Buster Keaton (actor)

Joe Walsh (of The Eagles and Extra Class Amateur WB6ACU)

Melissa Etheridge (musician)

Kirstie Alley (actress)

Charlie Parker (Jazz musician)

Campbell Brown (network journalist)

Athletes: Wilt Chamberlain, George Brett, Barry Sanders, Gale Sayers, and Jim Ryun.

### Population Center

The center of population of Kansas is located in Chase County, and the population density is 52.9 people per square mile

### Railroads and Rivers

As we travel east towards Limon from the Denver metro area, I-70 runs next to the Union Pacific (UP) railroad tracks on the north side of the road outside Denver and on south side of the road after crossing I-70 between Bennett and Strasburg. After Limon the UP tracks head east-south-east while we go almost due east. From Limon we'll see the old Rock Island tracks on the north side of the road all the way to Colby, KS. Those tracks are now used by the Kyle Railroad. The Kyle RR operates primarily in NE and north central Kansas going as far east as Salina.

When we head southeast out Colby, KS we'll pick up a spur of the UP that runs to Oakley where it joins the main line coming east from Colorado, the same line that left I-70 at Limon. The UP tracks will stay on the north side of I-70 until just east of Ogallah where there's not only an overpass over the tracks, but a bend in the road to accommodate the tracks and the highway. Interesting to note that the railroad tracks in western Kansas follow US 40, or is it the other way around? I-70 of course was built to roughly parallel US 40. Once we get past Russell the tracks run to the south then return about Abilene and run roughly parallel to I-70 until Kansas City. From Russell on it's difficult to see the tracks as they run further from the road, but the ever present white grain elevators mark the roadbed.

The Smokey Hill River will be south of I-70 as we pass Oakley, KS, although too far south to see from I-70. The Smoky Hill is named after the Kansas geographic region of the same name, which is the origin of the name of the major arterial road in Denver. We'll across the river just east of Junction City, KS. (Junction City is named for the confluence of the Smokey Hill and Republican Rives). The Republican River starts in Colorado in Yuma County and flows into Nebraska before entering Kansas south of Grand Island, NE. After the confluence the rivers are called the Kansas River. We'll be close to the Arkansas River in Hutch. It flows through the southern part of the city. We of course know the Arkansas as it comes out of the mountains at Pueblo and flows east to Kansas. We flirted with the river on the flight we launched out of Manzanola a few years ago.



## Previous EOSS GPSL Roundup

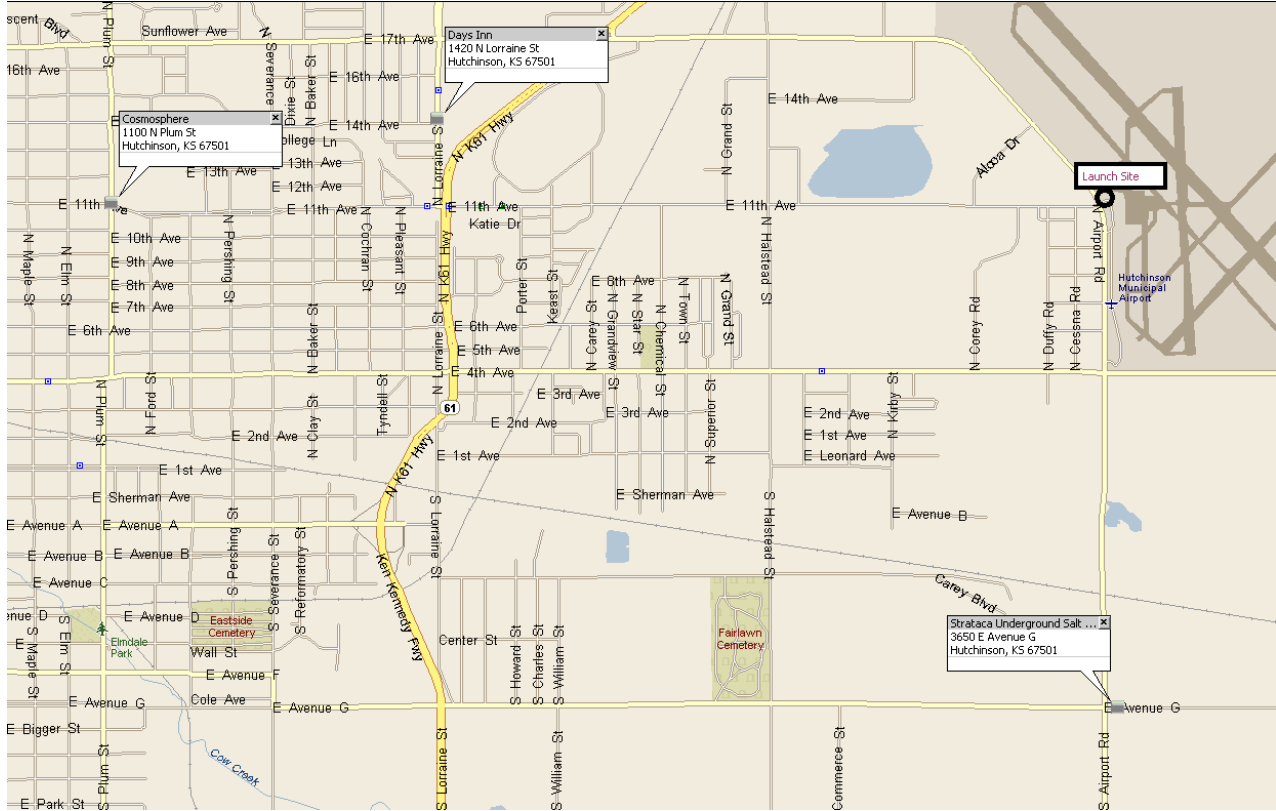
All balloons were 1200 gram, except in 2003 which was a 1500 gram and 2012 a 3000g.

<b>Date/ EOSS#</b>	<b>Conference/Launch Locations</b>	<b>EOSS Burst Alt. (ft.)</b>	<b>EOSS Flight Range/ Bearing</b>	<b>EOSS Payload String</b>
2001	Manhattan, KS	EOSS didn't attend.		
2002/ 58	Manhattan/Herington, KS	87,504	20/244	Unk
2003/ 67	Boulder/Deer Trail, CO	46,593 (leak?)	19/115	Unk
2004/ 80	Hutchinson/McPherson, KS	88,999	30/135	DF/Cutdown, Despun ATV, AE0SS-11 Module
2005/ 92	Omaha, NE/Treynor, IA	87,900	40/100	DF/Cutdown, Despun ATV, AE0SS-11 Module
2006 111	Hutchinson/Lyons, KS	90,016	12/23	DF/Cutdown, Despun ATV, Single CU Demosat, Crossband Repeater, AE0SS- 11 Module
2007 118	Grand Island/Doniphan, NE	90,850	31/232	DF/Cutdown, K0SCC ZigBee, N0KKZ/K0ANI DVR, BUNS Camera, Crossband Repeater, AE0SS-11 Module
2008/ 131	Liberty/Liberty, MO	88,760	29/163	DF/Cutdown, K0SCC ZigBee, ATV Lite, SamCam, Crossband Repeater, AE0SS-11 Module
2009/- 144	Topeka, KS	86,792	58/150	DF/Cutdown, K0SCC ZigBee, ATV Lite, SamCam, AE0SS-11 Module
2010/ 154	Hutchinson, KS/Hutch Airport	80,154	21.5/32	DF/Cutdown, SamCam, AE0SS-11 Module
2011/ 167	Colorado Springs, CO/Ramah State Wildlife Area	94,851	9.4/295	DF/Cutdown, GoPro Hero, Two CO Space Grant Demosats, AE0SS-11 Module
2012/ 176	Omaha, NE/Glenwood HS, Glennwood, IA	64,269 (early burst)	16/041	K0SCC-11 Cutdown/Beacon/APRS, three GoPro Hero HD Video Cameras, AE0SS-11 Module
2013/ 188	Pella, IA/Vermeer Corp. grounds	97,578	51.1/86.9	K0SCC-11 Cutdown/Beacon/APRS, two GoPro Hero HD Video Cameras, KC0UUO-11 Module (Qual Flt), AE0SS-11 Module
2014/- 196	Hutchinson, KS/ Crossroads Christian Church	95,712	61/50	K0SCC-11 Cutdown/Beacon/APRS, two GoPro Hero HD Video Cameras, Sam Cam 2, AE0SS-11 Module
2015	St. Louis, MO	EOSS did not attend.		
2016	Granbury, TX	96,332	79/239	KE0BMU-11 Beacon (Single payload)

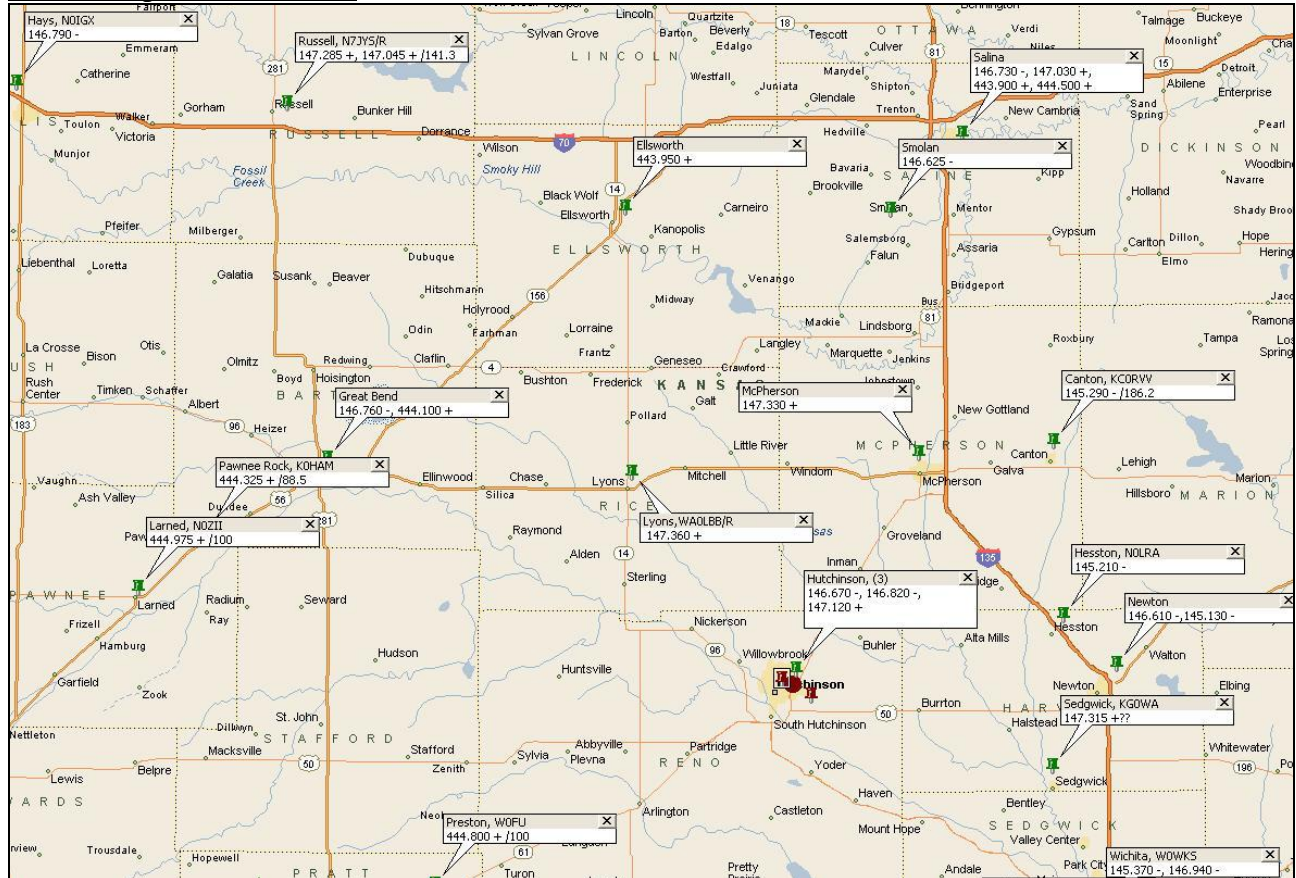


# Maps

## Hutchinson



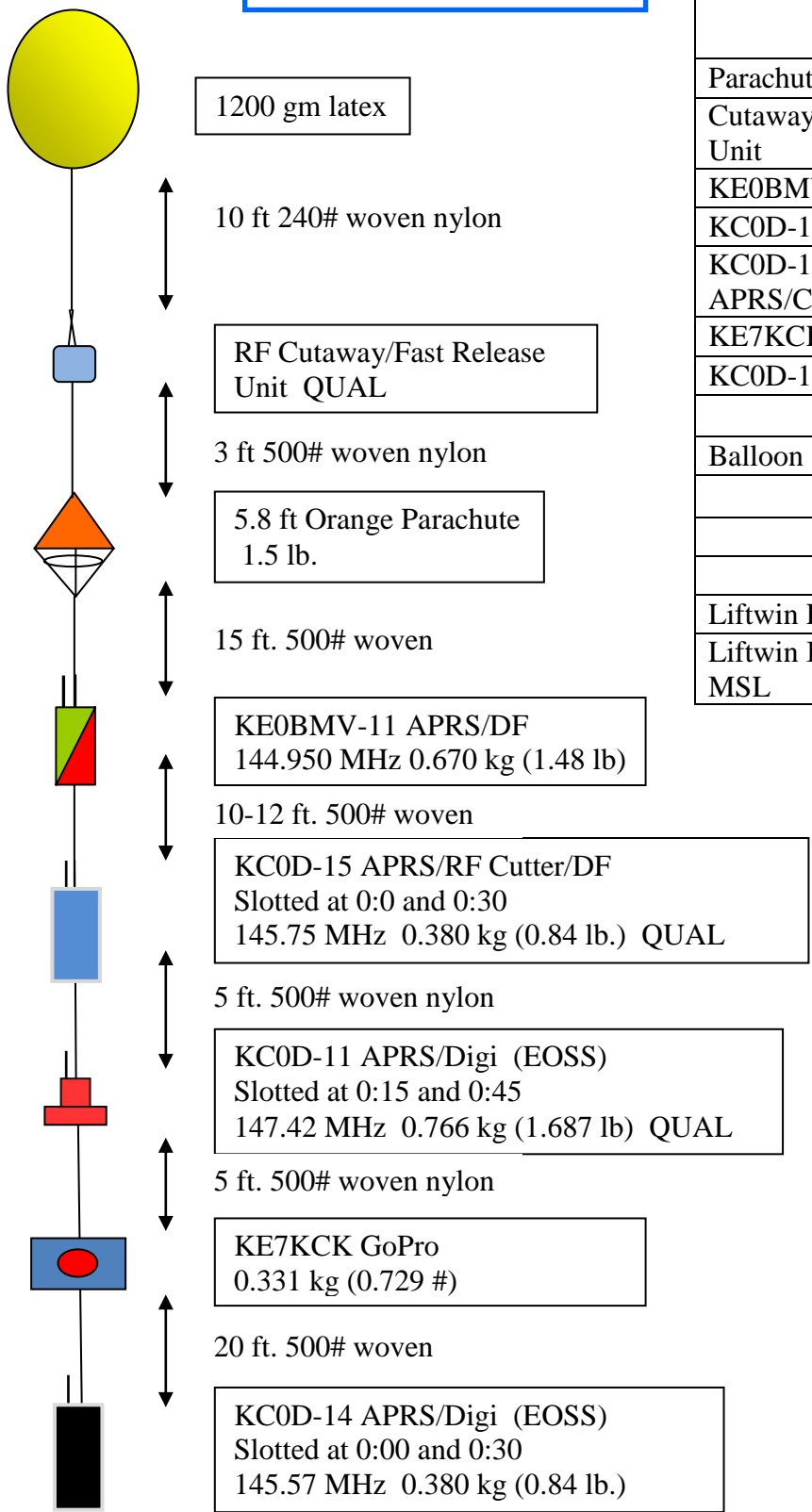
## Kansas Repeater Locations



# Payload Plan (EOSS-252)

Revision: 10 June 2017

Not even close to scale!



<i>Item</i>	<i>Weight, lb.</i>
Parachute	1.500
Cutaway/Fast Release Unit	0.61
KE0BMV-11	1.480
KC0D-11 APRS/Cutter	1.687
KC0D-15 APRS/Cutaway	0.84
KE7KCK GoPro	0.729
KC0D-14 Module	0.837
Neck load	7.68
Balloon	2.643
Gross wt	10.32
Gross lift factor	1.25
Neck lift	10.26
Liftwin H2 fill std cuft	174
Liftwin Burst Alt, kft MSL	99.4

## **Frequency & Time Slotting Plan for GPSL Flights**

The two primary (bottom) and backup (top) APRS beacons on our flight string will be the only beacons on their respective frequencies. Most of the other balloons will be beaconing on 144.34. MHz. See the payload plan just above for the frequencies.

## **Launch Location & Grid Data for TrackPoint**

Below are some inputs for TrackPoint to make adding the launch locations and the grid reference point easier.

- Here are the launch points. To enter them, on TrackPoint go to Setup>Lnch/Pred/Grid, then click on the little blue square to the right of the Launch Site drop down menu. A list will open in Notepad. Copy the three lines below and paste them to the bottom of the list. Then Save the Notepad file. When you get back to Denver, repeat the process, only delete the three lines and Save the file. In both cases you'll need to restart TrackPoint to see the changes.

### **Site 1:**

Hutchinson Airport  
Hutch AP,N,38,3.84,W,97,51.90,1542

### **Site 2:**

Newton Airport  
Newton AP,N,38,2.89,W,97,16.92,1532

- To put the new grid reference location, in TrackPoint open Setup>Lnch/Pred/Grid, then click on the little blue square on the right side between the words "Choice" and "Grid." When the list opens in Notepad paste in the line below and then Save notepad. This does not require a restart. Select "Hutch" as your grid reference point and set the grid to 0, 0 to watch the East miles (X) and the North miles (Y) decrease as we drive to Hutch. On the way back enter your home QTH as the grid reference point and watch the X and Y decrease on the drive back.

Hutch,N,38,4.194,W,97,54.21