

CURVE_ONE
Launch Manual

Sounding Balloon Aerial Photography Mission

Prepared by:
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Camera:

Canon A590IS with 8 gb SanDisk SDHC card– Hacked with CHDK 0.9.9-857

The card can conservatively hold 2100 jpeg images or 550 raw and jpeg image sizes. The anticipated flight time is 2-1/4 hours but 2-1/2 hours is assumed for calculation purposes. Based on this information, the camera will be setup to either take a photo every 16.5 seconds in RAW format or every 6 seconds in JPEG format. Given that 'shake' is an anticipated concern for the images, I will choose to use jpeg images to maximize quantity in-lieu of shooting in raw which could produce less useable images.

SETUP PROCESS:

- 1.) Install new lithium batteries.
- 2.) Tape the battery door closed, especially the little button on the bottom door. If that button moves, the camera will turn off. Wedge a piece of tape into the button hole and then tape over that!
- 3.) Put camera into preview mode.
- 4.) Turn on camera.
- 5.) Push the "menu" button.
- 6.) Scroll to the end and "update firmware" from 1.0.1.0 → 1.1.0.0
- 7.) Push the "printer" button to turn on CHDK.
- 8.) Push the "menu" button.
- 9.) Go to "scripting parameters."
- 10.) Check that 6 second delay time is provided, 2 shots are selected, and "endless" is on.
- 11.) Verify that RAW is turned off.
- 12.) Push the "menu" button to exit the menu.
- 13.) Put camera into camera mode.
- 14.) Set it to "AV" or (Aperture Priority.)
- 15.) Push the "printer" button to turn off CHDK.
- 16.) Set the F-value to 8.0.
- 17.) Turn off the flash.
- 18.) Turn off the display.
- 19.) Push the "printer" button to turn on CHDK.
- 20.) Push the shutter button to begin the intervalometer.
- 21.) Put camera the camera up to your ear and verify that you can hear it fire at-least three time.
- 22.) Load into payload.

GPS:

Motorola i290 with BoostMobile service and web access – GPS tracking program added to broadcast which can be viewed at <http://www.instamapper.com/>

SETUP PROCESS:

- 1.) Power On
- 2.) VERIFY THAT YOU HAVE A FULLY CHARGED BATTERY
- 3.) Call the phone to verify that it is receiving a signal and turn the ring volume all the way up. That could be helpful during the recovery.
- 4.) Press the “menu” button to the left of the navigation toggles.
- 5.) Press the “more” button.
- 6.) Hit the “right” button three times and select “games & apps.”
- 7.) Press the “more” button.
- 8.) Hit the “right” button times and select “gps tracker”
- 9.) Verify that it’s receiving a gps signal and is transmitting.
- 10.) Place new lithium batteries in the emergency battery supply.
- 11.) Plug the power supply into the phone.
- 12.) Load into payload.

Payload Assembly:

Styrofoam container with 3cm thick walls. Insulation from a frozen ham and frozen turkey delivery.
Packaging plastic and duct tape.

SETUP PROCESS:

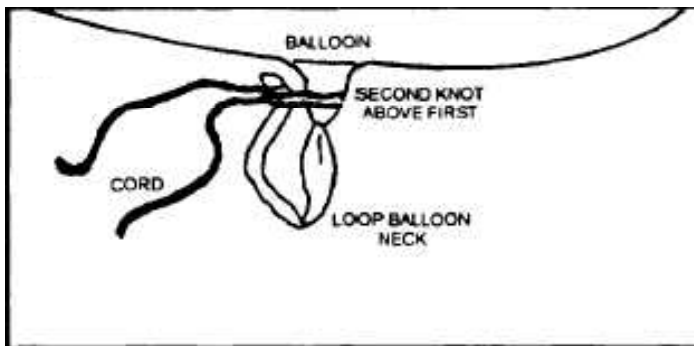
- 1.) Open heat packages and place in payload in the appropriate locations (front center & back left).
- 2.) Turn on GPS and Camera and place on top of heating pads.
- 3.) Place first piece of insulation over camera and phone assembly.
- 4.) Place second piece and press down with lid.
- 5.) Listen for photos firing from the camera and check instamapper to verify transmission status.
- 6.) Seal with packaging plastic making sure to stay away from the camera lens.
- 7.) Create duct tape support straps and stabilizers (2 pieces thick for support straps.)
- 8.) Connect to ~~radar reflector~~/parachute.

Balloon:

500 Gram Sounding Balloon. Burst Diameter of 15'.

SETUP PROCESS:

- 1.) Setup tank for filling.
- 2.) Put on gloves.
- 3.) Unroll balloon taking care to either not let it touch the ground or placing it on a tarp.
- 4.) Connect balloon to tank and begin filling.
- 5.) Balloon should be filled to a diameter of 5.25-feet; a tied-off rope with a circumference of 16.5-feet is provided to verify that the fill dimension has been achieved.
- 6.) Once that is achieved, the provided 3.5 lb mass should be hung from the balloon to verify if buoyancy is achieved. If the balloon is buoyant with a weight of 3.5 lbs, then it will have the requisite free lift to achieve the desired ascent rate.
- 7.) Tie a square knot around the balloon neck using the rope.
- 8.) Loop the end of the balloon nozzle up and over the first knot as shown below



- 9.) Tie the line from the parachute to the loop of the balloon neck.

BLAIN LAUNCH LOCATION - 12Z 25 June Model with 24 hour forecast period

	Time	Time	Time	Lat	Lon	Height		DME	VOR	U		V		Ascent Velocity (W)		P	T	T	RH
	Count	EST	UTC			m	ft			NM	mag	m/s	ft/s	m/s	ft/s				
Launch	0:00:00	10:15:00	14:15:00	40.34	-77.515	284	932	0	0	-0.1	-0.3	0.2	0.7	4.5	14.8	981	22	72	31
	0:00:11	10:15:11	14:15:11	40.34	-77.515	335	1,099	0	335	-0.2	-0.7	0.3	1.0	4.5	14.8	975	20	68	65
	0:01:01	10:16:01	14:16:01	40.341	-77.515	560	1,837	0	10	0.2	0.7	2.4	7.9	4.5	14.8	950	21	70	57
	0:01:52	10:16:52	14:16:52	40.342	-77.514	791	2,595	0.1	26	2.1	6.9	3.4	11.2	4.5	14.8	925	21	70	56
	0:02:45	10:17:45	14:17:45	40.343	-77.512	1,028	3,373	0.2	39	3.7	12.1	3.4	11.2	4.5	14.8	900	20	68	60
	0:04:35	10:19:35	14:19:35	40.347	-77.506	1,518	4,980	0.6	54	6.1	20.0	3.7	12.1	4.5	14.8	850	16	61	70
	0:06:30	10:21:30	14:21:30	40.351	-77.496	2,030	6,660	1.1	63	7.6	24.9	3.6	11.8	4.4	14.4	800	12	54	73
	0:08:31	10:23:31	14:23:31	40.354	-77.485	2,567	8,422	1.6	69	8.6	28.2	1.6	5.2	4.4	14.4	750	9	48	36
	0:10:39	10:25:39	14:25:39	40.354	-77.471	3,137	10,292	2.1	78	9.5	31.2	-1.6	-5.2	4.4	14.4	700	8	46	10
	0:12:57	10:27:57	14:27:57	40.35	-77.455	3,744	12,283	2.8	87	10.2	33.5	-3.4	-11.2	4.4	14.4	650	5	41	24
	0:15:23	10:30:23	14:30:23	40.346	-77.436	4,390	14,403	3.6	94	11.6	38.1	-2.7	-8.9	4.4	14.4	600	0	32	31
	0:17:59	10:32:59	14:32:59	40.344	-77.411	5,081	16,670	4.8	98	16.2	53.1	-1.4	-4.6	4.4	14.4	550	-4	25	26
	0:20:47	10:35:47	14:35:47	40.341	-77.375	5,827	19,117	6.4	100	20.2	66.3	-2.4	-7.9	4.4	14.4	500	-8	18	33
	0:23:50	10:38:50	14:38:50	40.336	-77.328	6,637	21,775	8.5	102	22.9	75.1	-3.2	-10.5	4.5	14.8	450	-13	9	52
	0:27:08	10:42:08	14:42:08	40.327	-77.274	7,524	24,685	11.1	105	23.8	78.1	-7.4	-24.3	4.5	14.8	400	-19	-2	42
	0:30:46	10:45:46	14:45:46	40.311	-77.213	8,504	27,900	13.9	108	23.3	76.4	-8.4	-27.6	4.5	14.8	350	-26	-15	22
	0:34:46	10:49:46	14:49:46	40.289	-77.138	9,595	31,480	17.5	111	29.2	95.8	-11.9	-39.0	4.6	15.1	300	-36	-33	31
	0:39:16	10:54:16	14:54:16	40.258	-77.042	10,834	35,545	22.2	113	31.4	103.0	-13.9	-45.6	4.6	15.1	250	-45	-49	52
4 miles SW of Harrisburg	0:44:29	10:59:29	14:59:29	40.209	-76.927	12,292	40,328	28	117	31	101.7	-21.2	-69.6	4.7	15.4	200	-55	-67	56
	0:50:45	11:05:45	15:05:45	40.14	-76.795	14,080	46,194	35.1	121	28.8	94.5	-19.3	-63.3	4.8	15.7	150	-65	-85	74
	0:59:15	11:14:15	15:14:15	40.071	-76.654	16,564	54,344	42.6	123	18.2	59.7	-10.7	-35.1	4.9	16.1	100	-62	-80	0
60,000 FT	1:05:01	11:20:01	15:20:01	40.046	-76.603	18,288	60,000	45.4	123	7	23.0	-5.7	-18.7	5	16.4	77	-62	-80	0
	1:06:37	11:21:37	15:21:37	40.041	-76.597	18,770	61,581	45.7	124	3.9	12.8	-4.3	-14.1	5	16.4	70	-62	-80	0
	1:13:31	11:28:31	15:28:31	40.025	-76.589	20,873	68,481	46.4	125	-0.8	-2.6	-4.4	-14.4	5.1	16.7	50	-57	-71	0
	1:24:09	11:39:09	15:39:09	40.008	-76.62	24,143	79,209	45.6	126	-7.5	-24.6	-1.5	-4.9	5.1	16.7	30	-52	-62	0
APEX	1:28:25	11:43:25	15:43:25	40.005	-76.643	25,455	83,514	44.7	127	-7.5	-24.6	-1.3	-4.3	5.1	16.7	20	-48	-54	-99
	1:29:07	11:44:07	15:44:07	40.004	-76.646	24,143	79,209	44.6	127	-7.5	-24.6	-1.5	-4.9	-29.4	-96.5	30	-52	-62	0
	1:31:14	11:46:14	15:46:14	40.001	-76.653	20,873	68,481	44.4	128	-0.8	-2.6	-4.4	-14.4	-21.8	-71.5	50	-57	-71	0
	1:33:00	11:48:00	15:48:00	39.997	-76.651	18,770	61,581	44.6	128	3.9	12.8	-4.3	-14.1	-17.8	-58.4	70	-62	-80	0
60,000 FT	1:33:28	11:48:28	15:48:28	39.995	-76.649	18,288	60,000	44.7	128	7	23.0	-5.7	-18.7	-17	-55.8	77	-62	-80	0
	1:35:18	11:50:18	15:50:18	39.987	-76.633	16,564	54,344	45.6	128	18.2	59.7	-10.7	-35.1	-14.4	-47.2	100	-62	-80	0
	1:38:32	11:53:32	15:53:32	39.961	-76.579	14,080	46,194	48.5	129	28.8	94.5	-19.3	-63.3	-11.2	-36.7	150	-65	-85	74
	1:41:25	11:56:25	15:56:25	39.929	-76.519	12,292	40,328	51.9	129	31	101.7	-21.2	-69.6	-9.4	-30.8	200	-55	-67	56
	1:44:10	11:59:10	15:59:10	39.903	-76.458	10,834	35,545	55.1	129	31.4	103.0	-13.9	-45.6	-8.2	-26.9	250	-45	-49	52
	1:46:49	12:01:49	16:01:49	39.885	-76.402	9,595	31,480	57.9	129	29.2	95.8	-11.9	-39.0	-7.4	-24.3	300	-36	-33	31
	1:49:23	12:04:23	16:04:23	39.871	-76.354	8,504	27,900	60.2	128	23.3	76.4	-8.4	-27.6	-6.8	-22.3	350	-26	-15	22
	1:51:54	12:06:54	16:06:54	39.86	-76.313	7,524	24,685	62.2	128	23.8	78.1	-7.4	-24.3	-6.3	-20.7	400	-19	-2	42
	1:54:19	12:09:19	16:09:19	39.853	-76.273	6,637	21,775	64	128	22.9	75.1	-3.2	-10.5	-5.9	-19.4	450	-13	9	52
	1:56:39	12:11:39	16:11:39	39.85	-76.238	5,827	19,117	65.6	127	20.2	66.3	-2.4	-7.9	-5.6	-18.4	500	-8	18	33
	1:58:54	12:13:54	16:13:54	39.847	-76.209	5,081	16,670	66.8	127	16.2	53.1	-1.4	-4.6	-5.4	-17.7	550	-4	25	26
	2:01:03	12:16:03	16:16:03	39.845	-76.188	4,390	14,403	67.8	127	11.6	38.1	-2.7	-8.9	-5.3	-17.4	600	0	32	31
	2:03:07	12:18:07	16:18:07	39.842	-76.172	3,744	12,283	68.5	126	10.2	33.5	-3.4	-11.2	-5.2	-17.1	650	5	41	24
	2:05:05	12:20:05	16:20:05	39.839	-76.158	3,137	10,292	69.1	126	9.5	31.2	-1.6	-5.2	-5.1	-16.7	700	8	46	10
	2:06:59	12:21:59	16:21:59	39.839	-76.146	2,567	8,422	69.6	126	8.6	28.2	1.6	5.2	-5	-16.4	750	9	48	36
	2:08:47	12:23:47	16:23:47	39.842	-76.136	2,030	6,660	70	126	7.6	24.9	3.6	11.8	-5	-16.4	800	12	54	73
	2:10:30	12:25:30	16:25:30	39.845	-76.128	1,518	4,980	70.3	126	6.1	20.0	3.7	12.1	-4.9	-16.1	850	16	61	70
	2:12:10	12:27:10	16:27:10	39.848	-76.122	1,028	3,373	70.4	125	3.7	12.1	3.4	11.2	-4.9	-16.1	900	20	68	60
	2:12:58	12:27:58	16:27:58	39.85	-76.12	791	2,595	70.5	125	2.1	6.9	3.4	11.2	-4.9	-16.1	925	21	70	56
	2:13:45	12:28:45	16:28:45	39.851	-76.12	560	1,837	70.5	125	0.2	0.7	2.4	7.9	-4.9	-16.1	950	21	70	57
	2:14:31	12:29:31	16:29:31	39.851	-76.12	335	1,099	70.4	125	-0.2	-0.7	0.3	1.0	-4.9	-16.1	975	20	68	65
Landing	2:14:41	12:29:41	16:29:41	39.851	-76.12	284	932	70.4	125	-0.1	-0.3	0.2	0.7	-4.9	-16.1	981	22	72	31

Item	Weight (gr)	Weight (lb)
Balloon	500	1.10
Parachute	32	0.07
Radar Reflector	0	0.00
Payload	658	1.45
Total Weight	1190	2.62

Uninflated Diameter	33"
Burst Dia	15'

was 82gr
3.40

color key
enter info
compare
result

Lift	Grams	Pounds (lb)
Free Lift*	850	1.87
Gross Lift	2040	4.50

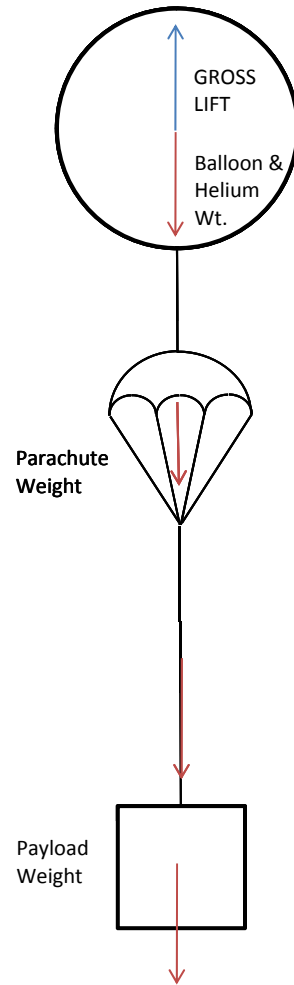
(buoyant force)

*Using nearspaceventures.com ascent rate calculator and comparison with kaysmont balloon data

Ascent Rate Calculator Input	
Balloon Wt (Gr)	500
Nozzle Lift (lbs)	3.73
Payload Wt (lbs)	1.70
Parachute Wt (oz)	1.13
Estimated Ascent (fpm)	1069
Estimated Ascent (mpm)	326

17.82 ft/sec
5.43 m/sec
12.1 mph

Method Utilized to Calculate the Required Design Quantity of Helium:			
Enter the balloon diameter anticipated at the time of launch as well as the pressure and the temperature as provided from the weather service. To ensure that sufficient lift is achieved, edit the diameter of the balloon until the free lift below equals the free lift above in row 9.			
m=PVM/RT	PV=nRT	where n=m/M	
Balloon Diameter	5.25 ft	1.60 meters	
Balloon Volume	75.77 cu. Ft.	2145 liters	
Pressure inside	0.97 atm	98600 Pascals	986 hPa
Temperature	25 C	298.15 Kelvin	77 F
R (gas constant)	0.082 atm/(K*mol)	8.314472 J/(K*mol)	
Molar Mass	4 helium (g/mol)	28.87 air	
Mass of Helium	0.75 lb	342 grams	
Displaced Air	5.44 lb	2465 grams	
Free Lift =	2.06 lbs		



Applicable Entry/Results Values for the chart above	
Curve_One Assumed Launch Design	
Dia	5.25 ft
hPa	986 hPa
Temp	25 C
Free Lift	1.88 lbs
Mass of Helium	0.5 lbs
Curve_One Assumed Burst Design	
	15 ft
	20 hPa
	-60 C
	0.29 lbs result

24 hour balloon trajectory forecast valid 12Z 26 June 2010

Initial Position

40.34 degrees north, 77.51 degrees west, 284 meters.

60,000 feet - Ascent

40.05 degrees north, 76.60 degrees west, 18288 meters.

45.4 nautical miles, 123 degrees magnetic from the initial position.

The magnetic declination is -10 degrees.

Burst Point

40.00 degrees north, 76.64 degrees west, 25455 meters.

44.7 nautical miles, 127 degrees magnetic from the initial position.

The magnetic declination is -10 degrees.

Impact

39.85 degrees north, 76.12 degrees west, 284 meters.

70.4 nautical miles, 125 degrees magnetic from the initial position.

The magnetic declination is -10 degrees.

Time	Lat	Lon	Height m	DME NM	VOR mag	U m/s	V m/s	W m/s	P hPa	T C	RH %
00:00:00	40.340	-77.515	284	0.0	0	-0.1	0.2	4.5	981	22	31
00:00:11	40.340	-77.515	335	0.0	335	-0.2	0.3	4.5	975	20	65
00:01:01	40.341	-77.515	560	0.0	10	0.2	2.4	4.5	950	21	57
00:01:52	40.342	-77.514	791	0.1	26	2.1	3.4	4.5	925	21	56
00:02:45	40.343	-77.512	1028	0.2	39	3.7	3.4	4.5	900	20	60
00:04:35	40.347	-77.506	1518	0.6	54	6.1	3.7	4.5	850	16	70
00:06:30	40.351	-77.496	2030	1.1	63	7.6	3.6	4.4	800	12	73
00:08:31	40.354	-77.485	2567	1.6	69	8.6	1.6	4.4	750	9	36
00:10:39	40.354	-77.471	3137	2.1	78	9.5	-1.6	4.4	700	8	10
00:12:57	40.350	-77.455	3744	2.8	87	10.2	-3.4	4.4	650	5	24
00:15:23	40.346	-77.436	4390	3.6	94	11.6	-2.7	4.4	600	0	31
00:17:59	40.344	-77.411	5081	4.8	98	16.2	-1.4	4.4	550	-4	26
00:20:47	40.341	-77.375	5827	6.4	100	20.2	-2.4	4.4	500	-8	33
00:23:50	40.336	-77.328	6637	8.5	102	22.9	-3.2	4.5	450	-13	52
00:27:08	40.327	-77.274	7524	11.1	105	23.8	-7.4	4.5	400	-19	42
00:30:46	40.311	-77.213	8504	13.9	108	23.3	-8.4	4.5	350	-26	22
00:34:46	40.289	-77.138	9595	17.5	111	29.2	-11.9	4.6	300	-36	31
00:39:16	40.258	-77.042	10834	22.2	113	31.4	-13.9	4.6	250	-45	52

6/25/2010

24 hour balloon trajectory forecast vali...

00:44:29	40.209	-76.927	12292	28.0	117	31.0	-21.2	4.7	200	-55	56
00:50:45	40.140	-76.795	14080	35.1	121	28.8	-19.3	4.8	150	-65	74
00:59:15	40.071	-76.654	16564	42.6	123	18.2	-10.7	4.9	100	-62	0
01:05:01	40.046	-76.603	18288	45.4	123	7.0	-5.7	5.0	77	-62	0
01:06:37	40.041	-76.597	18770	45.7	124	3.9	-4.3	5.0	70	-62	0
01:13:31	40.025	-76.589	20873	46.4	125	-0.8	-4.4	5.1	50	-57	0
01:24:09	40.008	-76.620	24143	45.6	126	-7.5	-1.5	5.1	30	-52	0
01:28:25	40.005	-76.643	25455	44.7	127	-7.5	-1.3	5.1	20	-48	-99
01:29:07	40.004	-76.646	24143	44.6	127	-7.5	-1.5	-29.4	30	-52	0
01:31:14	40.001	-76.653	20873	44.4	128	-0.8	-4.4	-21.8	50	-57	0
01:33:00	39.997	-76.651	18770	44.6	128	3.9	-4.3	-17.8	70	-62	0
01:33:28	39.995	-76.649	18288	44.7	128	7.0	-5.7	-17.0	77	-62	0
01:35:18	39.987	-76.633	16564	45.6	128	18.2	-10.7	-14.4	100	-62	0
01:38:32	39.961	-76.579	14080	48.5	129	28.8	-19.3	-11.2	150	-65	74
01:41:25	39.929	-76.519	12292	51.9	129	31.0	-21.2	-9.4	200	-55	56
01:44:10	39.903	-76.458	10834	55.1	129	31.4	-13.9	-8.2	250	-45	52
01:46:49	39.885	-76.402	9595	57.9	129	29.2	-11.9	-7.4	300	-36	31
01:49:23	39.871	-76.354	8504	60.2	128	23.3	-8.4	-6.8	350	-26	22
01:51:54	39.860	-76.313	7524	62.2	128	23.8	-7.4	-6.3	400	-19	42
01:54:19	39.853	-76.273	6637	64.0	128	22.9	-3.2	-5.9	450	-13	52
01:56:39	39.850	-76.238	5827	65.6	127	20.2	-2.4	-5.6	500	-8	33
01:58:54	39.847	-76.209	5081	66.8	127	16.2	-1.4	-5.4	550	-4	26
02:01:03	39.845	-76.188	4390	67.8	127	11.6	-2.7	-5.3	600	0	31
02:03:07	39.842	-76.172	3744	68.5	126	10.2	-3.4	-5.2	650	5	24
02:05:05	39.839	-76.158	3137	69.1	126	9.5	-1.6	-5.1	700	8	10
02:06:59	39.839	-76.146	2567	69.6	126	8.6	1.6	-5.0	750	9	36
02:08:47	39.842	-76.136	2030	70.0	126	7.6	3.6	-5.0	800	12	73
02:10:30	39.845	-76.128	1518	70.3	126	6.1	3.7	-4.9	850	16	70
02:12:10	39.848	-76.122	1028	70.4	125	3.7	3.4	-4.9	900	20	60
02:12:58	39.850	-76.120	791	70.5	125	2.1	3.4	-4.9	925	21	56
02:13:45	39.851	-76.120	560	70.5	125	0.2	2.4	-4.9	950	21	57
02:14:31	39.851	-76.120	335	70.4	125	-0.2	0.3	-4.9	975	20	65
02:14:41	39.851	-76.120	284	70.4	125	-0.1	0.2	-4.9	981	22	31



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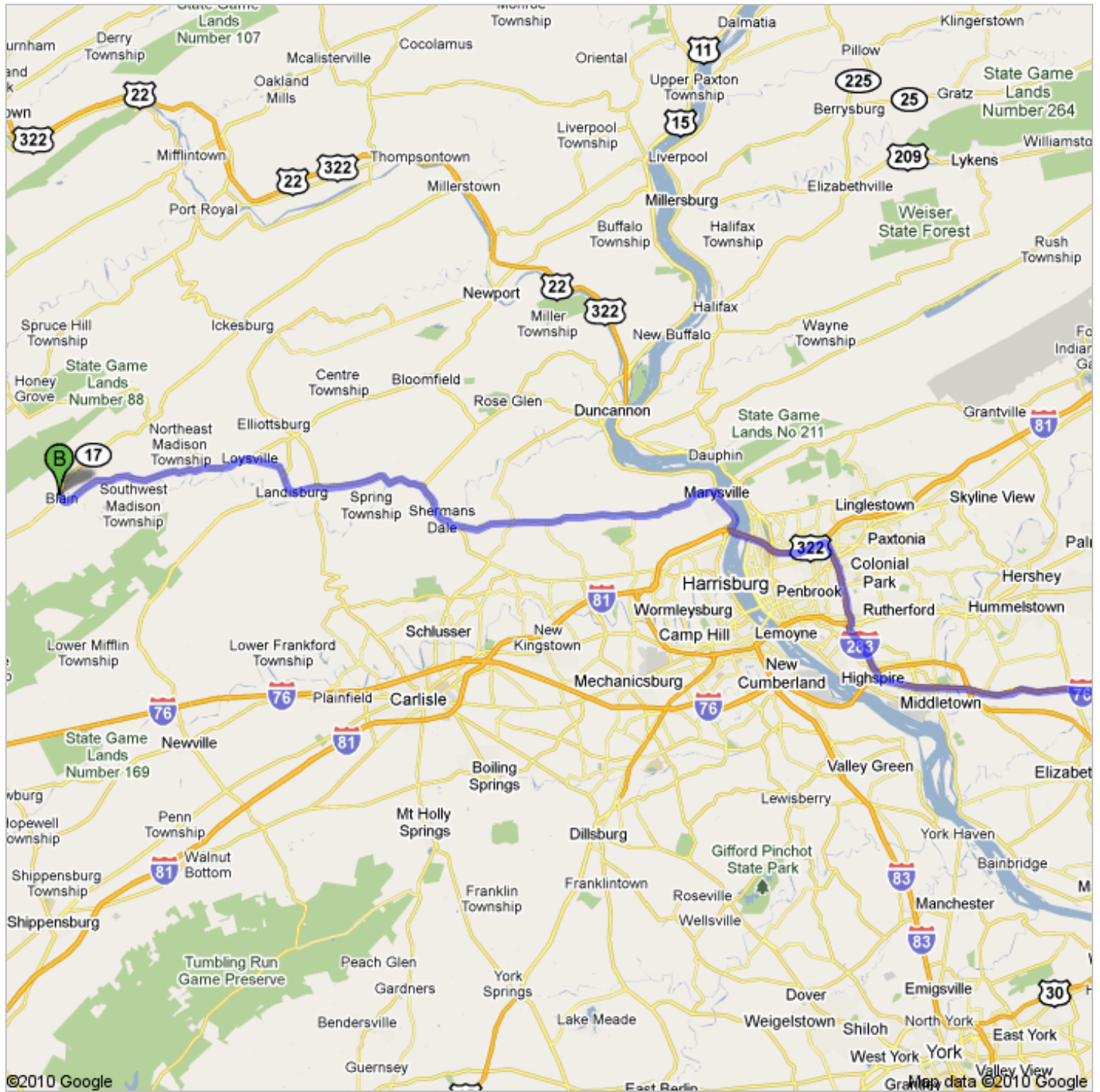
[University of Wyoming](#)


Questions about the weather data provided by this site can be addressed to [Larry Oolman](#)
(ldoolman@uwyo.edu)




















"Brad and Erica" to "Blain Elementary ..."
Directions to "Blain Elementary School"
Unknown road
140 mi – about 2 hours 36 mins

Save trees. Go green!
Download Google Maps on your phone at google.com/gmm



 "Brad and Erica"
Roxborough Ave

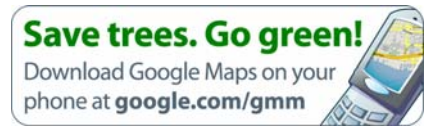
1. Head **southwest** on **Roxborough Ave** toward **Manayunk Ave** go 256 ft
total 256 ft
-  2. Take the 1st **right** onto **Manayunk Ave** go 0.3 mi
total 0.4 mi
About 1 min
-  3. Turn **left** at **Green Ln** go 0.6 mi
total 1.0 mi
About 2 mins
-  4. Turn **right** to merge onto **I-76 W** go 11.5 mi
total 12.4 mi
About 12 mins
-  5. Take the exit onto **I-76 W** toward **Harrisburg** go 79.0 mi
total 91.4 mi
Toll road
About 1 hour 18 mins
-  6. Take exit **247** to merge onto **I-283 N** toward **PA-283/Harrisburg/Hershey** go 3.3 mi
total 94.7 mi
Partial toll road
About 3 mins
-  7. Merge onto **I-83 N** go 3.8 mi
total 98.5 mi
About 5 mins
-  8. Continue onto **US-322 W** (signs for **I-81 S/Carlisle/Lewistown**) go 0.5 mi
total 99.0 mi
-  9. Merge onto **I-81 S** go 4.3 mi
total 103 mi
About 4 mins
-  10. Take exit **65** to merge onto **US-11 N/US-15 N/N Enola Rd** toward **Marysville** go 2.4 mi
total 106 mi
Continue to follow US-11 N/US-15 N
About 3 mins
-  11. Turn **left** at **PA-850 W/Valley St** go 13.0 mi
total 119 mi
About 15 mins
-  12. Turn **right** at **PA-34 N/PA-850 W/Spring Rd** go 2.5 mi
total 121 mi
About 4 mins
-  13. Turn **left** at **PA-850 W/Landisburg Rd** go 6.6 mi
total 128 mi
Continue to follow PA-850 W
About 10 mins
-  14. Turn **right** at **PA-850 W/Carlisle St** go 2.8 mi
total 131 mi
Continue to follow PA-850 W
About 4 mins
-  15. Turn **right** to stay on **PA-850 W** go 0.1 mi
total 131 mi
-  16. Turn **left** at **PA-274 W/PA-850 W/Shermans Valley Rd** go 9.8 mi
total 140 mi
Continue to follow PA-274 W
About 14 mins
-  17. Turn **left** go 194 ft
total 140 mi
About 1 min

 "Blain Elementary School"
Unknown road

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your




Directions to "Brad and Erica"
Roxborough Ave
58.8 mi – about **1 hour 23 mins**



"Impact"
Blackburn Rd

	1. Head east on Blackburn Rd toward Laura Ct About 1 min	go 0.4 mi total 0.4 mi
	2. Continue onto Wesley Rd	go 0.2 mi total 0.5 mi
	3. Turn left at Puseyville Rd About 3 mins	go 1.2 mi total 1.7 mi
	4. Continue onto Bartville Rd About 5 mins	go 2.2 mi total 3.9 mi
	5. Continue onto Noble Rd About 1 min	go 0.5 mi total 4.4 mi
	6. Turn left at S-2009/Noble Rd About 1 min	go 0.2 mi total 4.6 mi
	7. Take the 1st right to stay on S-2009/Noble Rd About 10 mins	go 5.4 mi total 9.9 mi
	8. Turn left to stay on S-2009/Noble Rd About 2 mins	go 0.8 mi total 10.7 mi
	9. Turn right at PA-372 E/S Bridge St Continue to follow PA-372 E About 2 mins	go 1.1 mi total 11.8 mi
	10. Turn left at Main St	go 449 ft total 11.9 mi
	11. Take the 1st right onto Liberty St	go 0.1 mi total 12.0 mi
	12. Continue onto Swan Rd About 5 mins	go 2.7 mi total 14.7 mi
	13. Turn right at US-30 E/Lincoln Hwy About 4 mins	go 2.4 mi total 17.1 mi
	14. Slight right at US-30 E About 20 mins	go 18.5 mi total 35.6 mi
	15. Take the exit onto US-202 N toward King of Prussia About 11 mins	go 10.5 mi total 46.1 mi
	16. Take the Devon Park Dr exit About 1 min	go 1.5 mi total 47.6 mi
	17. Merge onto I-76 E About 12 mins	go 10.0 mi total 57.6 mi
	18. Take exit 338 for Belmont Ave toward Green Ln	go 0.1 mi total 57.8 mi

-  19. Turn **left** at **Belmont Ave**
About 1 min go 0.2 mi
total 57.9 mi
-  20. Continue onto **Green Ln**
About 1 min go 0.5 mi
total 58.4 mi
-  21. Turn **right** at **Manayunk Ave**
About 1 min go 0.3 mi
total 58.7 mi
-  22. Turn **left** at **Roxborough Ave**
go 256 ft
total 58.8 mi

 "Brad and Erica"
Roxborough Ave

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Map data ©2010 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.