

Common Payload Bill of Materials

REV 7/14/16

TEAM:

Item	Description	Quantity
A	Satellite Tracking Payload	1
1	NAL Iridium Satellite Tracking Modem - handed out day of workshop	1
2	NAL Antennas - GPS and Iridium 2 antenna set	1
3	3.7 volt @6600ma x 1	1
5	3D Printed Bracket	1
6	Cable Assembly - Iridium	1
7	OCCAMS control board assembly for Iridium (with xbees included) - handed out day of workshop	1
8	Hex Standoff 4-40 Nylon 1/4 inch 36-4800-ND	3
9	Iridium Foam in A Bag - TO BE HANDED OUT	1
10	Foam Core Flight Housing - 1 piece laser cut	3
11	4-40 x 1/4 inch Nylon Screws phillips panhead H542-ND	3
12	4-40 x 3/8 inch Nylon Srews phillips panhead H544-ND	3
15	4-40 nylon nuts	6
B	Still Image Ground Station	1
1	RFD900+ Modem Ground Side System	1
2	USB to RFD900 Cable - Included above	1
3	RP-SMA Plug to N-Male, White Pigtail 10 ft 195-Series CA-RSPNMB010	1
4	Antenna 1 @ 900 MHZ - Patch HG8909P	1
5	Antenna 3 @ 900 MHZ - Yagi HG909Y	1
C	Video Ground Station	1
1	Ubiquity 5.8 Ghz Modem - Rocket M5	1
2	Ubiquity Light Weight Dish RD-5G30-LW	1
3	Power Over Ethernet-included with modem	1
4	Ethernet Cable to Computer - 10 foot	1
5	Ethernet Cable to Ubiquity M5 Dish side - 5 foot	1

D**Antenna Tracking System**

1

1	Tripod SitePro ALQR Heavy Duty Aluminum Tripod Quick Release 01-ALQR20-O	1
2	Servo City Motor #1 -7:1 360 degrees SPG5685A-CM-36007A	1
3	Servo City Motor #2 -7:1 360 degrees SPG5485A-BM-36007A	1
4	Screws 6-32 x 3/8" socket head - servo city number 632110	6
5	Screws 6-32 x 5/16" socket head - servo city number 632108	20
6	Screws 6-32 x 1/4" socket head - servo city number 632106	26
7	Nuts 6-32 with Nylon Insert for Actobotics Assembly from Servo City - 90631A007	18
8	# 6 Flat Washer	2
9	6-32 Series 10 slide mount Servo City P/N 585707	4
10	80/20 Series 15 Channel 1.5 inch sq part# 1515 5 inch long precut from 80/20	1
11	Channel 6 inch Actobotics part# 585446 from Servo City cut to 5 3/16" length	2
12	Channel 4.5 inch Actobotics part# 585444 from Servo City	2
13	1/4-20 40 series Slide-in Economy T Nut Centered Thread part number 40-3286 from 80/20 Inc	2
14	1/4-20 button head socket cap screw 0.625 length part number 3061 from 80/20 Inc	8
15	1/4-20 Fender Washer	2
16	Open on Purpose	0
17	5/16-18 x 11/16" flanged button head socket cap screw 80/20 number 3330	2
18	5/16-18 x 11/16" T-nut 80/20 inc part number 3278	2
19	Swivel Hub Bearing - Actobotics part# 545364 from Servo City	1
20	90 degree quad hub mount B Actobotics part#545424 from Servo City	3
21	Right Angle Bracket 90 flat channel bracket A Actobotics part# 585628 from Servo City	4
22	Right Angle Bracket 90 flat channel bracket A Actobotics part# 585628 from Servo City - custom drilled	1
23	Rocket M% Mounting Bracket - taken from large metal mounting bracket for dish	1
24	Base Plate 6"x6"x0.375 part number 8390 from 80/20 Inc - machined in house	1
25	Angle Bracket 4"x4"x4" 0.250 thick part number 8241 from 80/20 Inc- machined in house	1
26	Arduino	1
27	GPS Shield - Product ID 1272 from Adafruit or Mouser	1
28	Cable Assembly IMU	1
29	IMU Adafruit 9-DOF Absolute Orientation IMU Fusion Breakout - BNO055 PRODUCT ID: 2472	1
30	IMU 3-D printed mount	1
31	Power for Servos - USB and Transformer- Uses Wall Wart to Custom connection -	1
32	2 position header housing for servo power	1
33	2 crimp pins for servo power	2
34	Servo Extension Cable - 8 inches	1
35	Servo Driver - Pololu Micro Maestro	1

has N19 back-up parts

36	80/20 10 Series 1010 - 48 inches - TO BE HANDED OUT	1
37	USB Cables 10 foot - USB-A to USB-B - computer to Arduino	1
38	Arduino Mount 4-40 x 1/4 inch phillips head nylon screw - H542-ND Digikey	2
39	Arduinoi Mount 4-40 x 3/4 inch phillips head nylon screw - H550-ND Digikey	2
40	Arduino Mount 4-40 x 1/2 inch threaded hex stand off - 36-1902C-ND Digikey	2
41	3D Printed Micro Maestro Mounting Bracket	4
42	Pan Head phillips Screw for Sheet Metal, 18-8 Stainless Steel, No 0 Size, 3/16 inch length,(Maestro mount)	2
43	1/4-20 Slide Nut for series 10 80/20 part number 3204	6
44	USB Cable 10 ft - USB2.0 type -A to Mini B Cable - Computer to Micro Maestro	1
45	IMU Mount 2-56 x 1/2 inch phillips head nylon screw - H534-ND Digikey	4
46	IMU Mount 2-56 Nylon Nuts - H612-ND Digikey	4
47	1/4 in. washer	8
48	25 ft. extension cord	1
49	6 plug outlet	1
50	Channel 6 inch Actobotics part# 585446 from Servo City	1

E Still Image Payload 1

1	Raspberry Pi Camera - removeable lense- large	1
2	3.7 volt @6600ma (2 batteries - Pi and RFD)	2
3	RFD900+ Modem - Air Side - 2x 1/4 wave and 2x 1/2 wave antennas	1
4	Raspberry Pi2 Model B	1
5	Raspberry Pi Case	1
6	Edimax EW-7811Un 150Mbps 11n Wi-Fi USB Adapter	1
7	Pi Cable Assembly - Power for Still	1
8	Aluminum Sheet for Grounding	1
9	Real Time Clock Module	1
10	Flex Cable for Camera - 8 inch	1
11	Memory Card 64 Gbyte - handed out day of workshop	1
12	RP SMA Male to RP SMA Female Pigtail Cable	2
13	Camera Servo S0361 from Hobby King	1
14	Power Board Assembly	1
15	Hex Standoff 4-40 Nylon 1/4 inch 36-4800-ND	4
16	Hex Standoff 4-40 Nylon 3/4 inch 36-8440E-ND	7
17	4-40 x 3/4 inch Nylon Screws phillips panhead H550-ND	4
18	Still Image Battery Plate and Foam in N5 bag	1
19	Still Image Support Foam in N5 bag	1

20	Foam Core Flight Housing - 1 piece laser cut - TO BE HANDED OUT	3
21	4-40 x 1/4 inch Nylon Screws phillips panhead H542-ND	3
22	4-40 x 3/8 inch Nylon Srews phillips panhead H544-ND	11
24	Acrylic Plates	1
25	key switch bracket - right angle double D hole - in I bag	2
26	4-40 nylon nuts	4
27	3D printed camera housings for Still	1
28	Pan Head phillips Screw for Sheet Metal, 18-8 Stainless Steel, No 0 Size, 3/16 inch length,(servomount)	3
29	Internal Star Washer for Key Switch Mount Digikey Part Number A97567-ND	2
30	Cable Assembly - Key Switch	1
31	#3 metric washer	1
32	#2 x 1/4 inch camera mount	2

F Video Payload System 1

1	3.7 volt @6600ma (2 batteries - Pi and Ubiquity)	2
2	Flex Cable for Camera - 8 inch	1
3	Ethernet Cable - 12 inches flexible flat	2
4	Raspberry Pi2 Model B	1
5	Edimax EW-7811Un 150Mbps 11n Wi-Fi USB Adapter	1
6	Raspberry Pi Case	1
7	Pi Camera - small	1
8	Memory Card 64 Gbyte - handed out day of workshop	1
9	Ubiquity 5.8 Ghz Modem	1
10	Adapters SMACONN ADAPT RP SMA PLUG-SMA JACK ACX1248-ND	4
11	Fat Shark Antennas	4
12	Pi Cable Assembly - Power for Video	1
13	Camera Servo S0361 from Hobby King	1
14	Power Board Assembly	1
15	Hex Standoff 4-40 Nylon 1/4 inch 36-4800-ND	4
16	Hex Standoff 4-40 Nylon 3/4 inch 36-8440E-ND	4
17	4-40 x 3/4 inch Nylon Screws phillips panhead H550-ND	4
18	Video Battery Plate and Foam in N5 bag	1
19	Video Support Foam in N5 bag	1
20	Foam Core Flight Housing - 1 pieces laser cut - TO BE HANDED OUT	3
21	4-40 x 3/8 inch Nylon Srews phillips panhead H544-ND	8
23	Acrylic Plates	1

24	key switch bracket - right angle double D hole - in I bag	2
25	4-40 nylon nuts	4
26	3D printed camera housings for Video	1
27	M2 Size, 16 mm length, 0.4 mm Pitch Metric Nylon Pan Head phillips Machine Screw, Black (camera mount)	3
28	M2x0.4 Thread Size, 4.2mm wide, 1.5mm high, Nylon 6/6 Hex Nut, Black (camera mount)	3
29	Pan Head phillips Screw for Sheet Metal, 18-8 Stainless Steel, No 0 Size, 3/16 inch length,(servomount)	2
31	Internal Star Washer for Key Switch Mount Digikey Part Number A97567-ND	2
32	Cable Assembly - Key Switch	1
33	#3 metric washer	1

G OCCAMS control board assembly (with xbees included) 2

H Cut Down Flight Termination System - 1 1

1	DC Motor 6 Volt	1
2	DC Motor Housing	
3	3.3 volt battery 850 maH Sparkfun	1
4	3mm mounting hub Sparkfun - need to machine	1
5	Cable Assembly- Motor	
6	4-40 x 1/2 inch Nylon Screws phillips panhead H (under battery screw)	1
7	open	
8	4-40 nuts	9
9	Razor Blade	1
10	6-32 x 1/8 inch Nylon Machine Screw Pan Head phillips Mounting Hardware for Razor Blade	1
11	3D Printed Housing	1
12	OCCAMS control board assembly (with xbees included) - handed out day of workshop	1
13	Cut Down Foam in H Bag	1
14	4-40 x 3/8 inch Nylon Srews phillips panhead H (cutdown housing attachment)	4
16	4-40 nylon threaded rod 1.25 inch (motor housing attachment)	2

I Power Board Assembly 2

20	Cable Assembly - Key Switch	2
----	-----------------------------	---

J Common Payload Programmers for Each Team

1	AVR Pocket Programmer	1
---	-----------------------	---

2	FTDI to Serial Cable	2
3	Xbee Adapter Kit	1
4	USB -A to USB -micro B 6 foot	2

K Common Payload Chargers for Each Team

1	Battery Chargers - 3.7 volt lithium polymer	2
2	USB Cables for Chargers and Programmer - USB 2.0 Type A to Mini-B Cable -3 feet	2
3	Power Supply - Same as Pi Power x2	2
4	Fire Proof Lithium Polymer Battery Bag	1

L Common Payload Assembly Tools for Each Team (Shane has info)

1	long bubble level	1
2	circle bubble level	1
3	velcro stick 5"	1
4	screwdrivers	1
5	Veclro self stick 2ft	1
6	masking tape	1
7	Wrench Box/Open End - 5/16"	2
8	10 mm wrench	1
9	bent pliers	1
10	plug removers	1
11	sharpie	1
12	scissors	1
13	long zip ties	6
14	short zip ties	4
15	1/16 allen hex	1
16	3/16 allen hex	1
17	5/32 allen hex	1
18	7/64 t handle hex	1
19	7/64 ball end hex	1
20	Super Glue - Blue Ace Hardware	1
21	Long flathead Screwdriver	1
22	Short flathead Screwdriver	1
23	ESD mat kit	1
24	ESD plug	1
25	Paperclips large and small	1

26	ESD bugle bags	2
27	Rubber bands	6
28	Electrical Tape	1
29	Phillips Screwdriver	1

M Common Payload dedicated laptop 1

N Extra Hardware Kit (Double Check Extra Quantities)

1	Hex Standoff 4-40 Nylon 1/4 inch 36-4800-ND	3
2	Hex Standoff 4-40 Nylon 3/4 inch 36-8440E-ND	4
3	4-40 x 3/4 inch Nylon Screws phillips panhead H550-ND	10
4	4-40 x 1/4 inch Nylon Screws phillips panhead H542-ND	10
5	4-40 x 3/8 inch Nylon Srews phillips panhead H544-ND	10
6	4-40 nylon nuts	10
7	4-40 nylon threaded rod 1.25 inch (motor housing attachment)	2
8	6-32 x 1/8 inch Nylon Machine Screw Pan Head phillips Mounting Hardware for Razor Blade	4
9	Pan Head phillips Screw for Sheet Metal, 18-8 Stainless Steel, No 0 Size, 3/16 inch length,(servomount)	6
10	M2 Size, 12 mm length, 0.4 mm Pitch Metric Nylon Pan Head phillips Machine Screw, Black (camera mount)	4
11	M2x0.4 Thread Size, 4.2mm wide, 1.5mm high, Nylon 6/6 Hex Nut, Black (camera mount)	4
12	IMU Mount 2-56 x 1/2 inch phillips head nylon screw - H534-ND Digikey	4
13	IMU Mount 2-56 Nylon Nuts - H612-ND Digikey	4
14	1/4-20 Slide Nut for series 10 80/20 part number 3204	2
15	Arduino Mount 4-40 x 1/2 inch threaded hex stand off - 36-1902C-ND Digikey	2
16	5/16-18 x 11/16" flanged button head socket cap screw 80/20 number 3330	1
17	5/16-18 x 11/16" T-nut 80/20 inc part number 3278	1
18	Screws 6-32 x 3/8" socket head - servo city number 632110	2
19	Screws 6-32 x 5/16" socket head - servo city number 632108	5
20	Screws 6-32 x 1/4" socket head - servo city number 632106	25
21	Nuts 6-32 with Nylon Insert for Actobotics Assembly from Servo City - 90631A007	2
22	#6 Flat Washer	2
23	6-32 Series 10 slide mount Servo City P/N 585707	2
24	#3 metric washer	2
25	#2 x 1/4 inch camera mount	1
26	4-40 x 1/2 inch Nylon Screws phillips panhead H (under battery screw)	2
27	1/4-20 40 series Slide-in Economy T Nut Centered Thread part number 40-3286 from 80/20 Inc	1
28	1/4-20 button head socket cap screw 0.625 length part number 3061 from 80/20 Inc	1

with D5 kit