Orbital Debris Assessment Report

Prepared by ASTRA LLC
October 7, 2021

Atmospheric and Space Technology Research Associates
282 Century Place, Suite 1000
Louisville, CO

NASA DAS Software Version: 3.1.2

Prepared by Erik Stromberg, ASTRA, LLC
Version 3

Signed: Erik Stromberg
Name: Erik Stromberg
Title: RROCI Chief Engineer;
Director of Space Systems
Date: January 20, 2022

Self-Assessment

(based upon ODAR version, dated , 20)

Reqm't #	Launch Vehicle					Spacecraft				Comments
	Compliant	N/A	Not Compliant	Std. Non-Compliant	Incomplete	Compliant	N/A	Not Compliant	Incomplete	*For all incompletes, include risk assessment (low, medium, or high risk) of non-compliance & Project Risk Tracking #*
4.3-1.a *25 year limit*	☐	☐	☐	☐	☐	☒	☐	☐	☐	
4.3-1.b *<100 object x year limit*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.3-2 *GEO +/- 200km*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.4-1 *<0.001 Explosion Risk*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.4-2 *Passivate Energy Sources*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.4-3 *Limit BU Long term Risk*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.4-4 *Limit BU Short term Risk*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.5-1 *<.001 10cm Impact Risk*	☐	☐	☐	☐	☐	☒	☐	☐	☐	
4.5-2 *Postmission Disposal Risk*	☐	☐	☐	☐	☐	☒	☐	☐	☐	
4.6-1a-c *Disposal Method*	☐	☐	☐	☐	☐	☒	☐	☐	☐	Compliant with propulsion.
4.6-2 *GEO Disposal*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.6-3 *MEO Disposal*	☐	☐	☐	☐	☐	☐	☒	☐	☐	
4.6-4 *Disposal Reliability*	☐	☐	☐	☐	☐	☒	☐	☐	☐	
4.7-1 *Ground Population Risk*	☐	☐	☐	☐	☐	☒	☐	☐	☐	
4.8-1 *Tether Risk*	☐	☐	☐	☐	☐	☐	☒	☐	☐	

Section 1: Program Management and Mission Overview/Mission Description

Brief Description: ASTRA is developing and operating an Electro-Optical / Infrared (EO/IR) (EWS) sensing satellite. The LEO-based Rapid Revisit Optical Cloud Imager (RROCI) has an experimental mission to design, develop, and demonstrate an 8-channel prototype system. ASTRA's imager will utilize commercial off-the-shelf systems to measure cloud characteristics from a 12U satellite.

Launch: RROCI is planned to launch as a rideshare from a SpaceX Falcon 9, out of the Cape Canaveral, Florida, USA, in March of 2022.

Mission Duration: RROCI's mission is to conduct measurements on orbit for 1 year.

Launch Profile: RROCI is planned to be ejected from a canister attached to the SpaceX vehicle into a circular orbit at an altitude of 642 km (±20 km) at a sun-synchronous (~ 97.9° inclination) LTAN of 11 pm (LTDN of 11 am). This configuration provides ideal, repeatable LEO cloud observing.

Spacecraft On Orbit Maneuverability: The RROCI spacecraft contains 6x metal propellent propulsion (MPT) components. Each firing of a MPT produces a small, repeatable Impulse Bit. This approach allows for precise attitude and position control as well as orbital maneuvers. This design is capable of years of dormancy, yet it activates instantly when required. There is zero power

consumption when the system is idle. RROCI has 6x 6000Ns/U Total Impulse and 480 g of total fuel. The fuel mass results in > 150 delV (m/s) and deorbit capability from > 800 km, which is far above RROCI orbit. The propulsion system will be used for intermediate attitude maintenance over the mission 1 year lifetime. At the end of the mission, ASTRA will initiate and control the full de-orbit and descent of the spacecraft. ASTRA does not expect any interaction or potential physical interference with other operational spacecraft, but can exercise defensive maneuvers if needed.

Spacecraft On Orbit Attitude Control: The RROCI spacecraft contains magnetometers, sun sensors, and star trackers that support an active, continuously engaged 3-axis attitude control system comprised of reaction wheels and torquer rods. The system specifications are shown below:

Performance		
Total momentum storage per axis	+/-15, +/-30, +/-50[7]	mN.m.s
Maximum torque	2	mN.m
Magnetic moment	X/Y: 0.5 , Z: 0.4	$A.m^2$
Attitude determination accuracy	30	arcseconds
Pointing accuracy	<< 1	°
Slew rate	> 1.5[7]	°/s
Radiation tolerance	> 45[8]	krad (Si)
Operating temperature	- 45 / - 20 to + 40 / + 85[6]	°C

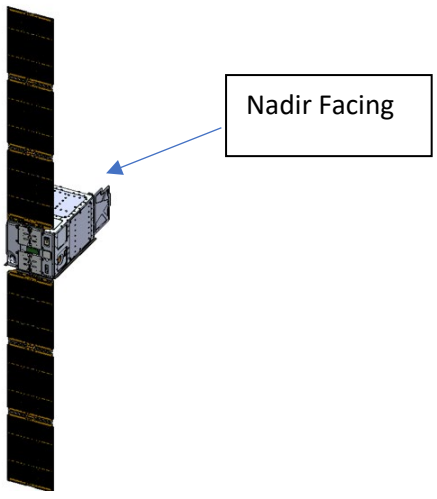
Spacecraft Power System: The RROCI spacecraft uses solar panels to generate energy on-orbit, with local battery storage. There are no other sources of on-orbit energy generation or storage. The power design includes two triple panel wings (articulated) and two single panel wings (fixed) for a 128.0W peak power generation BoL and 115.8W peak power generation EoL. The batteries are 3500mAh 18650 Li-ion cells with 10A peak output current and 100Wh energy storage per battery, for a total of 168W peak power output.

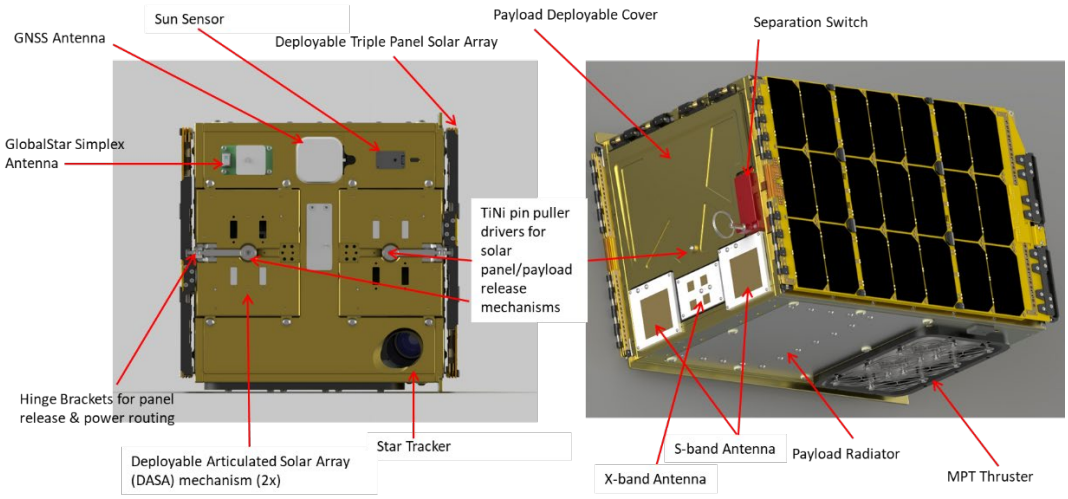
Section 2: Spacecraft Description

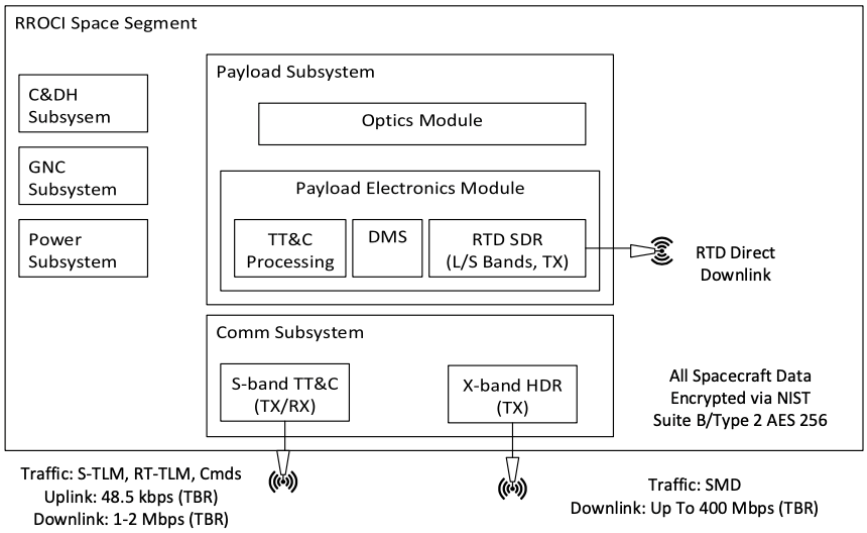
A detailed illustration of the RROCI spacecraft in the mission operation configuration with dimensional markings and marked component locations is shown below:

Stowed:

Deployed:







The system mass budget, at launch, is shown below:

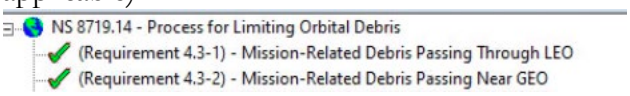
System Mass Budget							
Component	CBE (kg)	TRL	MEV	Instrument	CBE (kg)	TRL	MEV
Spacecraft				Electronics Module	1.55	9	1.60
ADCS	1.7	8	1.75	WFDL	0.30	9	0.31
Bus Interface Module (BIM)	0.05	9	0.05	OM (excluding cameras)	1.00	9	1.02
Payload Interface Module (PIM)	0.04	9	0.04	LWIR	0.05	9	0.05
Electrical Power System (EPSM)	0.23	9	0.24	MWIR	0.39	6	0.45
Battery (BM 2)	0.69	9	0.71	SWIR	0.10	9	0.10
Radio (XLINK)	0.2	8	0.21	VIS	0.09	9	0.09
Motherboard Module (MBM2)	0.03	9	0.03	Calibrator	0.47	9	0.48
Radio Host Module 2 (RHM 2) w/ Simplex	0.08	9	0.08	Deployable Cover	0.59	6	0.68
Propulsion (MPT)	1.88	6	1.94	Misc (i.e. cable, harnesses,radiators)	2.99	9	3.08
Solar Panel	2.1	9	2.16	**Sub Total**	**7.52**		**7.86**
SADA Mechanism	0.4	6	0.52				
Structure	2.9	9	2.99				
Bus Breakout Module (BBM)	0.02	9	0.02				
Power Distribution Board	0.15	9	0.15				
Ballast Mass	1.94	9	1.94				
GPS Receiver Module	0.11	9	0.11				
Sub Total	**12.52**		**12.94**				

Total	MPE	Total CBE	Total MVE	MRG (%)
	24	20.04	20.80	15.4%

The propulsion system consumable is a solid, with up to 480 g being used on orbit over the mission lifetime, including de-orbit (see description in Section 1). There are no fluids on the RROCI spacecraft. The attitude control system is described in Section 1. There are no pyrotechnic devices on RROCI. There are no radioactive materials on RROCI. There are no planned proximity operations for the RROCI mission. The power system is described in Section 1.

Section 3: Assessment of Spacecraft debris released during normal operations

There are no objects >1 mm expected to be released from the RROCI spacecraft any time after launch, including object dimensions, mass, and material. RROCI is compliant with 4.3-1 and 4.3-2 (not applicable).

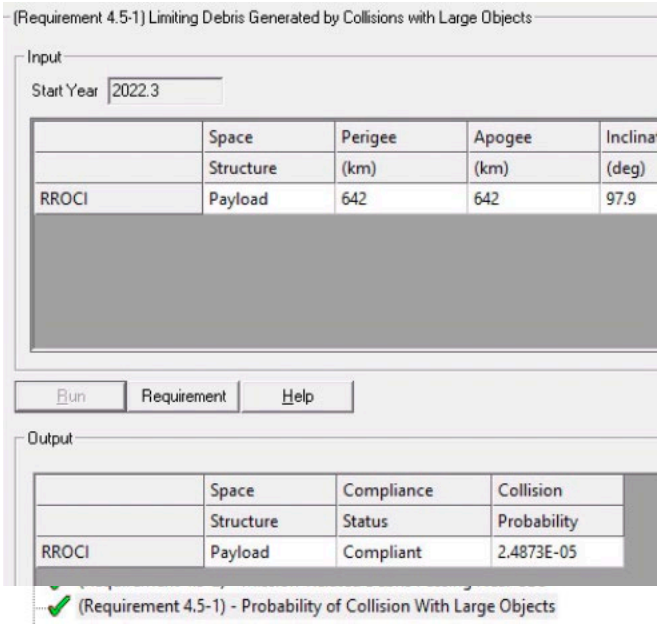


Section 4: Assessment of Spacecraft intentional breakups and potential for explosions

There are no identified potential causes of spacecraft breakup during deployment and mission operations on RROCI. There are no credible failure modes identified which may lead to an accidental explosion. RROCI will not perform intentional breakups or collisions during mission operations. No components will be passivated at EOM. RROCI is compliant with Requirements 4.4-1 through 4.4-4 (not applicable).

Section 5: Assessment of Spacecraft potential for on-orbit collisions

The probability of collision of the RROCI spacecraft probability with space objects larger than 10 cm in diameter during the orbital lifetime of the spacecraft is shown below, and is compliant with requirement 4.5-1.



The probability of collision with space objects, including orbital debris and meteoroids, of sufficient size to prevent postmission disposal is negligible. The RROCI propulsion system is redundant and comprised of solid propellent (i.e., a rupture of a gas tank is not applicable). There are no liquids on RROCI. The power system includes redundant solar panel strings and batteries. RROCI is compliant with requirement 4.5-2.

Section 6: Assessment of Spacecraft post-mission disposal plans and procedures

At the end of the mission, ASTRA will initiate and control the full de-orbit and descent of the spacecraft using its on-board propulsion system (see Section 1). For RROCI, 6x 6000Ns/U Total Impulse and 480 g of total fuel. The fuel mass results in > 150 delV (m/s) and deorbit capability from > 800 km.

RROCI is fully compliant with Requirements 4.6-1 through 4.6-4 by utilizing the on-board propulsion for a controlled re-entry for postmission disposal below the 642km initial altitude utilizing a circular orbit altitude reduction approach as outlined in the NASA Spacecraft Conjunction Assessment and Collision Avoidance Best Practices Handbook (NASA/SP-20205011318) section 4.1, requiring no direct coordination with NASA HSF offices for ISS or Chinese Space Station collision avoidance.

Section 7: Assessment of Spacecraft Hazardous Materials

- Detailed description of spacecraft components by size, mass, material, shape, and original location on the space vehicle, if the atmospheric reentry option is selected.

  This information can be found in Appendix A, output from ODAR, with size, mass, material, and shape, with altitude of disintegration defined.

- Summary of objects expected to survive an uncontrolled reentry, using NASA DAS, NASA Object Reentry Survival Analysis Tool (ORSAT), or comparable software

  This information can be found in Appendix A, output from ODAR, lines 72, 299, 304, 305.

- Calculation of probability of human casualty for the expected year of uncontrolled reentry and the spacecraft orbital inclination

  Output from the ODAR analysis (NASA DAS 3.1.2) is 1:100000000.

- Assessment of spacecraft compliance with Requirement 4.7-1

  Spacecraft is compliant with Requirement 4.7-1.

Section 7A: Assessment of Spacecraft Hazardous Materials

- Summary of the hazardous materials contained on the spacecraft using all columns and the format in paragraph 4.7.4.10.

  The only hazardous materials on RROCI are the battery modules, which are shown to re-enter at 62.5 km with no human casualty risk.

347	710-01552 Battery Module 2	273	2	Aluminum 6061-T6	Box	0.502	0.089	0.093	0.044	62.5	0	0

Section 8: Assessment for Tether Missions

Not applicable.

See Appendix A for DAS Activity Log

Appendix A: NASA DAS 3.1.2 Orbital Debris Analysis Results

Author:	Erik Stromberg
Organization:	Atmospheric & Space Technology Research Associates, LLC
Date Created:	October 4, 2021
Software Package Used:	NASA DAS 3.1.2 Orbital Debris Analysis Package
Results:	RROCI is fully compliant with NASA orbital debris requirements
Certified By:	Erik Stromberg
Certification Date:	October 4, 2021

Reentry Data

Row Num	Name	Parent	Qty	Material	Body Type	Thermal Mass	Diameter/Width	Length	Height	Demise Alt (km)	Total DCA	KE (J)
1	TOP LEVEL ASSEMBLY	0	1	Aluminum 7075-T6	Box	18.4839	0.226	0.366	0.226			
2	MODULE- ELECTRONICS- PAYLOAD	1	1	Aluminum 6061-T6	Box	1.5278	0.159	0.201	0.053	72.3	0	0
3	ASSY- DMS PCA	2	1	FR4	Box	0.1598	0.189	0.218	0.146	72.3	0	0
4	PCA- DATA MANAGEMENT SYSTEM	3	1	FR4	Box	0.1538	0.189	0.218	0.146	72.3	0	0
5	WEDGELOCK .260 X .250 X 5.8	3	2	Aluminum 6061-T6	Box	0.0015	0.006	0.147	0.006	72.2	0	0
6	SHCS- 0-80 X 1/4L- 18-8 SST	3	6	Stainless Steel (generic)	Cylinder	0.0005	0.0037	0.006		71.5	0	0
7	ASSY- HEATSINK- PEM	2	1	Aluminum 6061-T6	Box	0.5719	0.149	0.169	0.013	68.6	0	0
8	PLATE- HEATSINK- ELEC MOD	7	1	Aluminum 6061-T6	Box	0.4617	0.149	0.169	0.013	62.6	0	0
9	SHIELD- RF- POWER AMP	7	1	Aluminum 5052	Box	0.0073	0.034	0.066	0.003	68.3	0	0
10	PHCS- PHILLIPS- 2-56 X 1/8L- 18-8 SST	7	4	Stainless Steel (generic)	Cylinder	0.0002	0.0029	0.004		68.1	0	0
11	PHCS- PHILLIPS- 2-56 X 3/16L- 18-8 SST	7	6	Stainless Steel (generic)	Cylinder	0.0002	0.0024	0.006		68.2	0	0
12	BERGQUIST GAP PAD TGP 3004SF- 2.00 X 1.25 X .04 THK	7	1	Gap Pad	Box	0.0014	0.032	0.051	0.001	68.6	0	0
13	CABLE- AMPLIFIER POWER	7	1	Copper Alloy	Box	0.0995	0.034	0.066	0.008	66.1	0	0
14	CONN- RCPT HSG- 4POS- 3.00MM	13	1	Nylon	Box	0.0004	0.013	0.018	0.009	66.1	0	0
15	CONN- SOCKET- 20-24 AWG- CRIMP- GOLD 1	13	4	Copper Alloy	Cylinder	0.0001	0.002	0.011		66	0	0
16	WIRE- STRANDED- 24 AWG- PTFE- BLACK	13	1	Copper Alloy	Cylinder	0.0015	0.0018	0.081		65.9	0	0
17	WIRE- STRANDED- 24 AWG- PTFE- RED	13	1	Copper Alloy	Cylinder	0.0016	0.0019	0.081		65.9	0	0
18	AMPLIFIER- 1-8 - 2.7 GHz- 2W	13	1	Fiberglass	Box	0.0956	0.04	0.07	0.0186	63.9	0	0
19	ENCL- MOD- ELEC- PAYLOAD	2	1	Aluminum 6061-T6	Box	0.5888	0.159	0.201	0.053	69.5	0	0
20	WARFIGHTER	2	1	FR4	Box	0.077	0.09	0.09	0.018	72.3	0	0
21	PHMS- PHILLIPS- 2-56 X 1/4L- 18-8 SST	2	4	Stainless Steel (generic)	Cylinder	0.0005	0.0032	0.008		71.6	0	0
22	SHCS- 4-40 X 5/16L- HRS- PASSIVATED 1	2	14	Steel A-286	Cylinder	0.0005	0.003	0.011		71.8	0	0
23	STANDOFF- M-F- 3/16 X 1.00L HEX- 2-56 THD- 18-8 SST	2	2	Stainless Steel (generic)	Cylinder	0.0041	0.006	0.029		71.1	0	0
24	SHCS- 2-56 X 3/16L- HRS- PASSIVATED 1	2	10	Steel A-286	Cylinder	0.0005	0.0034	0.007		71.7	0	0
25	GAP PAD 1	2	1	Gap Pad	Box	0.0002	0.007	0.013	0.002	72.3	0	0
26	GAP PAD 2	2	1	Gap Pad	Box	0.0003	0.01	0.011	0.002	72.3	0	0
27	GAP PAD 3	2	1	Gap Pad	Box	0.0004	0.01	0.014	0.002	72.3	0	0
28	GAP PAD 4	2	1	Gap Pad	Box	0.0003	0.01	0.01	0.002	72.3	0	0
29	GAP PAD 5	2	1	Gap Pad	Box	0.0005	0.014	0.014	0.002	72.3	0	0
30	GAP PAD 6	2	1	Gap Pad	Box	0.0008	0.014	0.022	0.002	72.3	0	0
31	GAP PAD 7	2	1	Gap Pad	Box	0.0018	0.027	0.027	0.002	72.3	0	0
32	GAP PAD 8	2	1	Gap Pad	Box	0.0002	0.008	0.008	0.002	72.3	0	0
33	GAP PAD 9	2	1	Gap Pad	Box	0.0002	0.008	0.008	0.002	72.3	0	0
34	GAP PAD 10	2	1	Gap Pad	Box	0.0005	0.014	0.014	0.002	72.3	0	0
35	GAP PAD 11	2	1	Gap Pad	Box	0.0008	0.015	0.02	0.002	72.3	0	0
36	GAP PAD 12	2	1	Gap Pad	Box	0.0024	0.031	0.031	0.002	72.3	0	0
37	PHMS- PHILLIPS- 0-80 X 1/8L- 18-8 SST 1	2	4	Stainless Steel (generic)	Cylinder	0.0002	0.0029	0.004		71.8	0	0
38	STANDOFF- HEX- F-F- .188 HEX- 2-56 X .406L- 18-8 SST	2	2	Stainless Steel (generic)	Cylinder	0.0014	0.006	0.01		71.3	0	0
39	SHCS- 2-56 X 1/4L- HRS- PASSIVATED 1	2	4	Steel A-286	Cylinder	0.0007	0.0036	0.009		71.6	0	0
40	CABLE- RF- X-BAND ANTENNA	2	1	Copper Alloy	Cylinder	0.0119	0.008	0.425		72.2	0	0
41	CONN SMP JACK STR 50 OHM CRIMP 1	40	1	Copper Alloy	Cylinder	0.0014	0.005	0.016		71.8	0	0
42	CONN- SMA PLUG- R/A- 50OHM- SOLDER	40	1	Copper Alloy	Cylinder	0.0023	0.008	0.029		71.9	0	0
43	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 1	40	1	Copper Alloy	Cylinder	0.0082	0.003	0.425		72	0	0
44	CABLE- RF- ELEC ENCL- S-BAND	2	1	Copper Alloy	Cylinder	0.0089	0.008	0.387		72.2	0	0
45	CONN SMA PLUG- STR- 50OHM- SOLDER	44	1	Copper Alloy	Cylinder	0.0009	0.008	0.017		72	0	0
46	CONN SMA PLUG R/A 50 OHM SOLDER 1	44	1	Copper Alloy	Cylinder	0.0022	0.008	0.029		71.9	0	0
47	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 2	44	1	Copper Alloy	Cylinder	0.0058	0.003	0.387		72.1	0	0
48	CABLE- RF- AMP TO WFDL	2	1	Copper Alloy	Cylinder	0.0085	0.008	0.386		72.2	0	0
49	CONN- MMCX PLUG- RA- 50 OHM- SOLDER 1	48	1	Copper Alloy	Cylinder	0.0014	0.0036	0.016		71.7	0	0
50	CONN- SMA PLUG- STR- 50 OHM- SOLDER 1	48	1	Copper Alloy	Cylinder	0.0014	0.008	0.021		72	0	0
51	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 3	48	1	Copper Alloy	Cylinder	0.0057	0.003	0.386		72.1	0	0
52	CABLE- DMS TO ASTROSDR	2	1	Copper Alloy	Cylinder	0.0127	0.005	0.08		71.5	0	0

53	CONN- SELF-MATE- 60POS- SMD- GOLD	52	2	Copper Alloy	Box	0.00275	0.005	0.015	0.005	70.9	0	0
54	STANDOFF- F-F- 1/8 x 3/16L HEX- 0-80 THD- 18-8 SST	52	4	Stainless Steel (generic)	Cylinder	0.0009	0.003	0.08		71.4	0	0
55	PHMS- PHILLIPS- 0-80 X 1/8L- 18-8 SST 2	52	4	Stainless Steel (generic)	Cylinder	0.0009	0.0043	0.008		70.6	0	0
56	CABLE- RF- ELEC ENCL- POWER AMP	2	1	Copper Alloy	Cylinder	0.0067	0.004	0.328		72.1	0	0
57	CONN- MMCX PLUG- RA- 50 OHM- SOLDER 2	56	1	Copper Alloy	Cylinder	0.0009	0.004	0.018		71.9	0	0
58	CONN- SMA PLUG- STR- 50 OHM- SOLDER 2	56	1	Copper Alloy	Cylinder	0.0009	0.004	0.018		71.9	0	0
59	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 4	56	1	Copper Alloy	Cylinder	0.0049	0.003	0.328		72	0	0
60	CABLE- WFDL POWER	2	1	Copper Alloy	Cylinder	0.034	0.011	0.184		71.7	0	0
61	CABLE- NANO-D- M-M- 8.00- 15 POS	60	1	Copper Alloy	Box	0.0114	0.011	0.184	0.003	71.5	0	0
62	GLENAIR NANO-D M CONN	60	2	Copper Alloy	Box	0.0113	0.011	0.184	0.003	71.5	0	0
63	GROMMET- THREADED	2	2	Stainless Steel (generic)	Cylinder	0.0014	0.005	0.019		71.6	0	0
64	NUT- GROMMET	2	1	Stainless Steel (generic)	Cylinder	0.0009	0.008	0.003		71.4	0	0
65	NUT- HEX- 3/8 X 1/8 HEX- 10-32- 18-8 SST	2	3	Stainless Steel (generic)	Cylinder	0.0018	0.01	0.003		70.9	0	0
66	WASHER- FLAT- .365 OD X .21 ID X .029-.032 THK- 18-8 SST	2	3	Stainless Steel (generic)	Cylinder	0.0005	0.009	0.003		71.8	0	0
67	SUB ASSEMBLY- BENCH- OPTICS	1	1	Aluminum 6061-T6	Box	2.9512	0.173	0.206	0.168	71.7	0	0
68	ASSY- CALIBRATOR ARM	67	1	Aluminum 6061-T6	Box	0.1208	0.038	0.14	0.011	69.9	0	0
69	CALIBRATOR ARM	68	1	Aluminum 6061-T6	Box	0.0318	0.038	0.14	0.011	69.3	0	0
70	BLACK BODY- CALIBRATOR	68	1	Copper Alloy	Cylinder	0.0222	0.034	0.0102		68.6	0	0
71	STANDOFF- BLACK BODY	68	3	G10	Cylinder	0.0001	0.0032	0.007		69.9	0	0
72	COUNTERWEIGHT- CALIBRATOR	68	5	Tungsten	Cylinder	0.0077	0.01	0.006		0	1.85	8.09
73	BACKER- DIFFUSER- GLASS	68	2	Glass	Cylinder	0.00405	0.022	0.007		69.9	0	0
74	SPECTRALON DIFFUSER	68	1	Aluminum (generic)	Flat Plate	0.0002	0.032	0.032		69.9	0	0
75	RING- RETAINING- DIFFUSER	68	1	Aluminum 6061-T6	Cylinder	0.0014	0.023	0.007		69.7	0	0
76	FMS- 2-56 X 7/16L- OFFSET CRUCIFORM- TI	68	3	Titanium (generic)	Cylinder	0.0002	0.003	0.012		69.5	0	0
77	CPSS- 6-32 X .125L- 18-8 SST	68	1	Stainless Steel (generic)	Cylinder	0.0001	0.004	0.003		69.7	0	0
78	O-RING- DASH NUMBER 024- PTFE- DUROMETER 55D	68	1	PTFE	Cylinder	0.0001	0.023	0.007		69.9	0	0
79	CABLE- CAL ARM BLACK BODY- HEATER/SENSORS	68	1	Copper Alloy	Cylinder	0.0175	0.033	0.511		69.8	0	0
80	CONN- MICROSTRIP SOCKET- 10POS- 26 AWG- SOLDER CUP- CENTER LATCH 1	79	1	LCP Thermoplastic	Box	0.0001	0.013	0.015	0.005	69.8	0	0
81	SENSOR- TEMPERATURE 1	79	1	Lead Element	Cylinder	0.0001	0.002	0.044		69.8	0	0
82	SENSOR- TEMPERATURE 2	79	1	Macor Ceramic	Box	0.0005	0.006	0.007	0.005	69.5	0	0
83	HEATER- BLACK BODY	79	1	Copper Alloy	Flat Plate	0.0018	0.033	0.033		69.7	0	0
84	WIRE 30 AWG- WHITE	79	1	Copper Alloy	Cylinder	0.0075	0.0015	0.511		69.7	0	0
85	WIRE 30 AWG- Black	79	1	Copper Alloy	Cylinder	0.0075	0.0015	0.511		69.7	0	0
86	SUB ASSEMBLY- BAFFLE- INNER- UPPER	67	1	Aluminum 6061-T6	Box	0.2765	0.081	0.206	0.026	70	0	0
87	BAFFLE- INNER- UPPER	86	1	Aluminum 6061-T6	Box	0.2365	0.081	0.206	0.021	67.9	0	0
88	MOUNT- HEATER- AUXILIARY- BLACKBODY	86	1	Aluminum 6061-T6	Cylinder	0.0288	0.044	0.014		68.3	0	0
89	SPACER- MOUNT- HEATER- AUXILIARY- BLACKBODY	86	3	G10	Cylinder	0.0001	0.005	0.003		70	0	0
90	SPACER- BAFFLE- MOUNT- HEATER- AUXILIARY- BLACKBODY	86	3	G10	Cylinder	0.0001	0.046	0.014		70	0	0
91	FMS- 2-56 X 1/2L- OFFSET CRUCIFORM- TI	86	3	Steel A-286	Cylinder	0.0005	0.003	0.014		69.6	0	0
92	CABLE- BLACK BODY- HEATER/SENSORS	86	1	Copper Alloy	Cylinder	0.0091	0.015	0.269		69.9	0	0
93	CONN- MICROSTRIP SOCKET- 10POS- 26 AWG- SOLDER CUP- CENTER LATCH 2	92	1	LCP Thermoplastic	Box	0.0001	0.013	0.015	0.005	69.9	0	0
94	HEATER- AUXILIARY- BLACK BODY	92	1	Copper Alloy	Flat Plate	0.0033	0.053	0.053		69.8	0	0
95	Thermistor 1	92	3	Lead Element	Cylinder	0.0001	0.002	0.044		69.9	0	0
96	WIRE- 30 AWG- WHITE 1	92	1	Copper Alloy	Cylinder	0.0054	0.002	0.269		69.7	0	0
97	LWIR SUB ASSEMBLY	67	1	Aluminum 6061-T6	Box	0.2508	0.058	0.106	0.041	69.3	0	0
98	CAMERA MOUNT- BOSON	97	1	Aluminum 6061-T6	Box	0.0844	0.053	0.058	0.041	67.7	0	0
99	PCA- BREAKOUT BOARD- LWIR	97	1	Fiberglass	Box	0.0059	0.037	0.053	0.019	69.2	0	0
100	THERMAL STRAP- BOSON	97	1	Copper Alloy	Box	0.068	0.026	0.095	0.006	67.8	0	0
101	SPACER- BOSON	97	4	G10	Cylinder	0.0001	0.004	0.007		69.3	0	0
102	DOWEL ROD- M1 x 4mmL- TITANIUM	97	2	Titanium (generic)	Cylinder	0.0001	0.003	0.004		68.9	0	0
103	CLAMP- BREAKOUT BOARD- LWIR	97	1	Aluminum 6061-T6	Box	0.0027	0.009	0.032	0.006	69	0	0
104	CAMERA- BOSON- 640SL	97	1	Aluminum 6061-T6	Box	0.0137	0.021	0.021	0.012	67.9	0	0
105	SHCS- 4-40 X 3/8L- HRS- PASSIVATED 1	97	3	Steel A-286	Cylinder	0.0005	0.003	0.011		68.9	0	0
106	SHIM- LENS- II-VI	97	1	Aluminum 6061-T6	Cylinder	0.0036	0.041	0.013		69.1	0	0
107	PIN- LENS- ALIGNMENT- II-VI	97	2	Stainless Steel (generic)	Cylinder	0.0005	0.003	0.013		68.9	0	0
108	LENS- BOSON- II-VI	97	1	Aluminum 6061-T6	Cylinder	0.0494	0.041	0.04		67.7	0	0
109	SHCS- 4-40 X 1/4L- HRS- PASSIVATED	97	4	Steel A-286	Cylinder	0.0005	0.004	0.008		68.9	0	0
110	SHCS- 2-56 X 3/16L- HRS- PASSIVATED 2	97	5	Steel A-286	Cylinder	0.0005	0.004	0.006		68.8	0	0
111	SHCS- M1.6 X 0.35 X 10mmL- HRS- PASSIVATED	97	8	Steel A-286	Cylinder	0.0005	0.003	0.011		68.9	0	0
112	CABLE- LWIR REMOTE INTERFACE BOARD TO CAMERA INTERFACE	97	1	Copper Alloy	Cylinder	0.0045	0.007	0.015		68.4	0	0
113	CONN- PLUG- 80 POS- SMD- GOLD 1	112	1	Copper Alloy	Cylinder	0.00225	0.006	0.015		67.8	0	0

114	CONN- PLUG- 80 POS- SMD- GOLD 2	112	1	Copper Alloy	Cylinder	0.00225	0.006	0.015		67.8	0	0
115	CABLE- LWIR- HEATERS/SENSORS (incomplete)	97	1	Copper Alloy	Cylinder	0.007	0.025	0.254		69.3	0	0
116	CONN- MICROSTRIP SOCKET- 10POS- 26 AWG- SOLDER CUP- CENTER LATCH 3	115	1	LCP Thermoplastic	Box	0.0001	0.013	0.015	0.005	69.3	0	0
117	HEATER- LWIR	115	2	Copper Alloy	Flat Plate	0.0005	0.025	0.038		69.3	0	0
118	SENSOR- TEMPERATURE 3	115	2	Macor Ceramic	Box	0.0005	0.008	0.009	0.004	69	0	0
119	WIRE- 30 AWG- WHITE 2	115	1	Copper Alloy	Cylinder	0.0049	0.002	0.254		69.1	0	0
120	SUB ASSEMBLY- MWIR	67	1	Aluminum 6061-T6	Box	0.4934	0.073	0.136	0.067	68.9	0	0
121	CAMERA MOUNT- NEUTRINO	120	1	Aluminum 6061-T6	Box	0.1379	0.067	0.071	0.06	67	0	0
122	PCA- BREAKOUT BOARD- MWIR	120	1	Fiberglass	Box	0.0083	0.024	0.047	0.019	68.7	0	0
123	SHIM- MWIR CAMERA FOCUS- ALIGNED	120	1	Aluminum 6061-T6	Box	0.0064	0.044	0.061	0.001	68.6	0	0
124	CAMERA- NEUTRINO LC- 125K-F2.5 NS	120	1	Aluminum 6061-T6	Box	0.2177	0.061	0.074	0.045	65.6	0	0
125	SHCS- 4-40 X 3/8L- HRS- PASSIVATED 2	120	12	Steel A-286	Cylinder	0.0005	0.003	0.011		68.5	0	0
126	MWIR LENS	120	1	Aluminum 6061-T6	Cylinder	0.1053	0.062	0.052		66.8	0	0
127	SHCS- 0-80 X .375L 18-8 SST	120	4	Stainless Steel (generic)	Cylinder	0.0005	0.003	0.01		68.3	0	0
128	CABLE- CRYOCOOLER- MWIR	120	1	Copper Alloy	Cylinder	0.0033	0.003	0.076		68.6	0	0
129	CONN- HOUSING- 4POS- LK	128	2	Nylon	Flat Plate	0.0001	0.01	0.01		68.6	0	0
130	CONN- SOCKET- 28-30 AWG- CRIMP GOLD 1	128	4	Nylon	Flat Plate	0.0001	0.01	0.01		68.6	0	0
131	WIRE- STRANDED- 28 AWG- PTFE- BLACK	128	1	Copper Alloy	Cylinder	0.0014	0.002	0.076		68.5	0	0
132	WIRE- STRANDED- 28 AWG- PTFE- RED	128	1	Copper Alloy	Cylinder	0.0013	0.002	0.076		68.5	0	0
133	CABLE- MWIR- HEATER/SENSORS	120	1	Copper Alloy	Cylinder	0.0065	0.025	0.254		68.8	0	0
134	CONN- MICROSTRIP SOCKET- 10POS- 26 AWG- SOLDER CUP- CENTER LATCH 4	133	1	LCP Thermoplastic	Box	0.0001	0.013	0.015	0.005	68.8	0	0
135	HEATER- MWIR	133	1	Copper Alloy	Flat Plate	0.0005	0.025	0.051		68.8	0	0
136	SENSOR- TEMPERATURE 4	133	2	Macor Ceramic	Box	0.0005	0.008	0.009	0.004	68.6	0	0
137	WIRE- 30 AWG- WHITE 3	133	1	Copper Alloy	Cylinder	0.0049	0.002	0.254		68.7	0	0
138	SUB ASSEMBLY- SWIR	67	1	Aluminum 6061-T6	Box	0.2024	0.063	0.09	0.042	69.6	0	0
139	CAMERA MOUNT- SWIR- LEFT	138	1	Aluminum 6061-T6	Box	0.0186	0.04	0.049	0.023	69	0	0
140	CAMERA MOUNT- SWIR- RIGHT	138	1	Aluminum 6061-T6	Box	0.0195	0.04	0.049	0.027	69	0	0
141	PCA- BREAKOUT BOARD- SWIR	138	1	Fiberglass	Box	0.0084	0.038	0.038	0.018	69.3	0	0
142	SHCS- M2 X 0.4 X 6L- ALLOY STEEL- PASSIVATED	138	4	Steel A-286	Cylinder	0.0005	0.004	0.007		69.1	0	0
143	TAU 1202 SWIR CAMERA	138	1	Aluminum 6061-T6	Box	0.0942	0.038	0.046	0.038	67.1	0	0
144	SWIR LENS 25mm F/8 900-1700nm	138	1	Aluminum 6061-T6	Cylinder	0.0521	0.033	0.033		67.1	0	0
145	SHCS- M1.6 X 0.35- 3mmL- ALLOY STEEL	138	2	Steel A-286	Cylinder	0.0005	0.004	0.005		68.9	0	0
146	PHCS- PHILLIPS- M1.6 X 20mmL- 18-8 SST	138	2	Stainless Steel (generic)	Cylinder	0.0005	0.002	0.021		69.2	0	0
147	SPACER- 1/8 OD X .064 ID X 1/8L- 18-8 SST	138	2	Stainless Steel (generic)	Cylinder	0.0005	0.004	0.005		68.8	0	0
148	CABLE- TEC COOLER- SWIR	138	1	Copper Alloy	Cylinder	0.0046	0.013	0.056		69.4	0	0
149	CABLE- TEC POWER (PIGTAIL)	148	1	Copper Alloy	Cylinder	0.0038	0.013	0.056		69.2	0	0
150	CONN- HOUSING- 2POS- LK	148	1	Nylon	Flat Plate	0.0001	0.01	0.01		69.4	0	0
151	CONN- SOCKET- 28-30 AWG- CRIMP GOLD 2	148	2	Nylon	Flat Plate	0.0001	0.01	0.01		69.4	0	0
152	CABLE- SWIR- SENSOR	148	1	Copper Alloy	Cylinder	0.0005	0.003	0.044		69.3	0	0
153	CONN- MICROSTRIP SOCKET- 2POS- 26 AWG- SOLDER CUP- CENTER LATCH 1	152	1	LCP Thermoplastic	Box	0.0001	0.005	0.013	0.003	69.3	0	0
154	SENSOR- TEMPERATURE 5	152	1	Lead Element	Cylinder	0.0001	0.002	0.044		69.3	0	0
155	WIRE- 30 AWG- WHITE 4	152	1	Copper Alloy	Cylinder	0.0003	0.002	0.025		69.2	0	0
156	SUB ASSEMBLY- VISIBLE CAMERA	67	1	Aluminum 6061-T6	Box	0.1321	0.062	0.098	0.042	70.4	0	0
157	CAMERA MOUNT- VISIBLE- RIGHT	156	1	Aluminum 6061-T6	Box	0.019	0.039	0.048	0.027	69.8	0	0
158	CAMERA MOUNT- VISIBLE- LEFT	156	1	Aluminum 6061-T6	Box	0.018	0.039	0.048	0.023	69.8	0	0
159	VISIBLE CAMERA	156	1	Aluminum 6061-T6	Box	0.092	0.037	0.098	0.037	69.1	0	0
160	SHCS- M3 X .4 X 6mmL- HRS- PASSIVATED	156	6	Steel A-286	Cylinder	0.0005	0.004	0.007		69.9	0	0
161	CABLE- VISIBLE- SENSOR	156	1	Copper Alloy	Cylinder	0.0001	0.003	0.044		70.4	0	0
162	CONN- MICROSTRIP- SOCKET- 2POS- 26AWG- SOLDER CUP- CENTERLATCH 1	161	1	LCP Thermoplastic	Box	0.00003	0.005	0.013	0.003	70.4	0	0
163	SENSOR- TEMPERATURE 6	161	1	Lead Element	Cylinder	0.00003	0.002	0.044		70.4	0	0
164	WIRE- 30 AWG- WHITE 5	161	1	Copper Alloy	Cylinder	0.00004	0.001	0.028		70.4	0	0
165	CABLE- MOTOR	67	1	Copper Alloy	Cylinder	0.2391	0.008	0.533		70.2	0	0
166	CONN- MICROSTRIP SOCKET- 3POS- 26 AWG- SOLDER CUP- CENTER LATCH 1	165	1	LCP Thermoplastic	Box	0.0001	0.005	0.013	0.003	70.2	0	0
167	WIRE- 30 AWG- WHITE 6	165	1	Copper Alloy	Cylinder	0.0107	0.002	0.533		70	0	0
168	ASSY- MOTOR & ENCODER WHEEL	165	1	Aluminum 6061-T6	Cylinder	0.2283	0.04	0.09		66.6	0	0
169	PLATE- ENCODER MOUNT	168	1	G10	Cylinder	0.0005	0.012	0.004		66.6	0	0
170	MOTOR- STEPPER- WITH GEARBOX	168	1	Aluminum 6061-T6	Cylinder	0.2267	0.04	0.08		62.3	0	0
171	FHMS- PHILLIPS- 82 DEG- 2-56 X 3/16L- 18-8 SST	168	1	Stainless Steel (generic)	Cylinder	0.0002	0.003	0.005		66.3	0	0
172	CODEWHEEL- DUAL-TRACK- 64 PERIODS	168	1	Fiberglass	Cylinder	0.0009	0.028	0.009		66.6	0	0
173	BENCH- OPTICS	67	1	Aluminum 6061-T6	Box	0.4377	0.127	0.206	0.01	68.8	0	0
174	BACKER- BENCH- OPTICS	67	1	Aluminum 6061-T6	Box	0.3561	0.165	0.206	0.01	69.5	0	0

175	BAFFLE- INNER- LOWER	67	1	Aluminum 6061-T6	Box	0.1846	0.068	0.206	0.021	70.3	0	0
176	SHIM- VIS CAMERA- ALIGNED	67	1	Aluminum 6061-T6	Box	0.0231	0.051	0.063	0.003	71	0	0
177	SHIM- VISIBLE CAMERA	176	1	Aluminum 6061-T6	Box	0.0231	0.051	0.063	0.003	70.1	0	0
178	SHIM- SWIR CAMERA- ALIGNED	67	1	Aluminum 6061-T6	Box	0.0177	0.051	0.063	0.003	71.2	0	0
179	SHIM- SWIR CAMERA	178	1	Aluminum 6061-T6	Box	0.0177	0.051	0.063	0.003	70.5	0	0
180	SHIM- MWIR CAMERA- ALIGNED	67	1	Aluminum 6061-T6	Box	0.0286	0.06	0.071	0.003	71	0	0
181	SHIM- MWIR CAMERA	180	1	Aluminum 6061-T6	Box	0.0286	0.06	0.071	0.003	70.1	0	0
182	SHIM- LWIR CAMERA- ALIGNED	67	1	Aluminum 6061-T6	Box	0.0209	0.053	0.058	0.003	71	0	0
183	SHIM- BOSON	182	1	Aluminum 6061-T6	Box	0.0209	0.053	0.058	0.003	70.2	0	0
184	MOUNT- MOTOR- CALIBRATOR	67	1	Aluminum 7075-T6	Box	0.01	0.028	0.062	0.007	71.3	0	0
185	WASHER- MLI	67	16	G10	Cylinder	0.0001	0.013	0.004		71.7	0	0
186	STANDOFF- MLI	67	4	G10	Cylinder	0.0018	0.013	0.028		71.7	0	0
187	HOOK- MLI- TOP PLATE	67	2	G10	Box	0.0027	0.016	0.024	0.013	71.7	0	0
188	HOOK- MLI- BASE PLATE	67	2	G10	Box	0.0027	0.016	0.024	0.013	71.7	0	0
189	MOUNT- ENCODER- CLEARANCE	67	1	Aluminum 7075-T6	Box	0.0132	0.019	0.041	0.013	71	0	0
190	MOUNT- ENCODER- THREADED	67	1	Aluminum 7075-T6	Box	0.015	0.019	0.041	0.011	70.9	0	0
191	BLANKET- MLI- PEM	67	1	MLI	Box	0.0032	0.104	0.203	0.006	71.7	0	0
192	BLANKET- OPTICS- MLI	67	1	MLI	Box	0.0045	0.168	0.203	0.006	71.7	0	0
193	DOWEL PIN- .063 DIA X .500 L- 18-8 SST	67	12	Stainless Steel (generic)	Cylinder	0.0003	0.002	0.013		71.3	0	0
194	SHCS 6-32 X 1/2L- HRS- PASSIVATED	67	15	Steel A-286	Cylinder	0.0012	0.004	0.016		71.1	0	0
195	SHCS- 6-32 X 3/4L- HRS- PASSIVATED	67	6	Steel A-286	Cylinder	0.0017	0.004	0.023		71.1	0	0
196	SHCS- 5-40 X .375L- HRS- PASSIVATED	67	4	Steel AISI 316	Cylinder	0.0008	0.004	0.012		71.2	0	0
197	SHCS- 6-32 X 7/16L- HRS- PASSIVATED	67	8	Steel A-286	Cylinder	0.0012	0.004	0.015		71.1	0	0
198	SHCS- 6-32 X 5/16L- HRS- PASSIVATED	67	4	Steel A-286	Cylinder	0.0009	0.004	0.011		71.1	0	0
199	SHCS- 2-56 X 1/4L- HRS- PASSIVATED 2	67	2	Steel A-286	Cylinder	0.0003	0.003	0.009		71.4	0	0
200	SHCS- 4-40 X 3/4L- HRS- PASSIVATED	67	2	Steel A-286	Cylinder	0.0011	0.003	0.022		71.2	0	0
201	MACHINE KEY- 3/32 X 3/32 X 1/4L- 300 SST	67	1	Stainless Steel (generic)	Box	0.0002	0.003	0.006	0.002	71.3	0	0
202	CBL TIE MNT- #8 SCRW- TEFZEL	67	3	Teflon	Box	0.0009	0.011	0.016	0.007	71.6	0	0
203	RETAINING RING- EXTERNAL- .225 ID X .025 THK- 15-7 SST	67	16	Stainless Steel (generic)	Cylinder	0.0001	0.01	0.003		71.6	0	0
204	CABLE- ENCODER	67	1	Copper Alloy	Cylinder	0.007	0.025	0.064		71.5	0	0
205	CONN- MICROSTRIP SOCKET- 6POS- 26 AWG- SOLDER CUP- CENTER LATCH	204	1	LCP Thermoplastic	Box	0.0001	0.01	0.013	0.003	71.5	0	0
206	ENCODER	204	2	FR4	Cylinder	0.00085	0.025	0.008		71.5	0	0
207	WIRE- 28 AWG- RED	204	1	Copper Alloy	Cylinder	0.0013	0.002	0.064		71.3	0	0
208	WIRE- 28 AWG- YELLOW	204	1	Copper Alloy	Cylinder	0.0013	0.002	0.064		71.3	0	0
209	WIRE- 28 AWG- WHITE	204	1	Copper Alloy	Cylinder	0.0013	0.002	0.064		71.3	0	0
210	WIRE- 28 AWG- BLACK	204	1	Copper Alloy	Cylinder	0.0013	0.002	0.064		71.3	0	0
211	CABLE- OPTICS BENCH- HEATERS/SENSORS- TOP (incomplete)	67	1	Copper Alloy	Cylinder	0.0265	0.076	0.508		71.6	0	0
212	CONN- MICROSTRIP SOCKET- 15POS- 26 AWG- SOLDER CUP- CENTER LATCH	211	1	LCP Thermoplastic	Box	0.0001	0.013	0.021	0.003	71.6	0	0
213	OPTICS BENCH HEATER	211	2	Copper Alloy	Flat Plate	0.0009	0.025	0.076		71.6	0	0
214	SENSOR- TEMPERATURE 7	211	2	Lead Element	Cylinder	0.0001	0.002	0.044		71.6	0	0
215	WIRE- 30 AWG- WHITE 7	211	1	Copper Alloy	Cylinder	0.0101	0.002	0.508		71.4	0	0
216	WIRE- 26 AWG- WHITE 1	211	1	Copper Alloy	Cylinder	0.0143	0.002	0.508		71.4	0	0
217	CABLE- OPTICS BENCH- SENSORS- BOTTOM	67	1	Copper Alloy	Cylinder	0.0119	0.012	0.587		71.6	0	0
218	CONN- MICROSTRIP SOCKET- 8POS- 26 AWG- SOLDER CUP- CENTER LATCH	217	1	LCP Thermoplastic	Box	0.0001	0.012	0.013	0.003	71.6	0	0
219	SENSOR- TEMPERATURE 8	217	1	Lead Element	Cylinder	0.0001	0.002	0.044		71.6	0	0
220	WIRE- 30 AWG- WHITE 8	217	1	Copper Alloy	Cylinder	0.0117	0.002	0.587		71.4	0	0
221	CABLE- SENSOR- OM BOTTOM (incomplete)	67	1	Copper Alloy	Cylinder	0.001	0.006	0.051		71.6	0	0
222	CONN- MICROSTRIP SOCKET- 3POS- 26 AWG- SOLDER CUP- CENTER LATCH 2	221	1	LCP Thermoplastic	Box	0.0001	0.006	0.013	0.003	71.6	0	0
223	SENSOR- TEMPERATURE 9	221	1	Lead Element	Cylinder	0.0001	0.002	0.044		71.6	0	0
224	WIRE- 30 AWG- WHITE 9	221	1	Copper Alloy	Cylinder	0.0008	0.002	0.051		71.5	0	0
225	ASSY- FRONT PANEL- PEM	1	1	Aluminum 6061-T6	Box	0.0953	0.052	0.188	0.016	77	0	0
226	FRONT- MODULE- ELECTRONICS- PAYLOAD	225	1	Aluminum 6061-T6	Box	0.0725	0.052	0.188	0.003	75.9	0	0
227	SPACER- 1/8 OD X .09 ID X 1/16L- 18-8 SST	225	2	Stainless Steel (generic)	Cylinder	0.0001	0.003	0.002		76.5	0	0
228	SHCS- 2-56 X 3/16L- HRS- PASSIVATED 3	225	2	Steel A-286	Cylinder	0.0003	0.003	0.007		76.5	0	0
229	CABLE- PEM SURVIVAL HEATER	225	1	Copper Alloy	Cylinder	0.022	0.084	0.533		77	0	0
230	CONN- RCPT- HSG- 5 POS- 3mm	229	1	Nylon	Box	0.0004	0.013	0.018	0.009	77	0	0
231	CONN- SOCKET- 20-24 AWG- CRIMP- GOLD 2	229	4	Copper Alloy	Cylinder	0.00005	0.002	0.002		76.7	0	0
232	HEATER- SURVIVAL- PEM	229	1	Copper Alloy	Flat Plate	0.0009	0.032	0.084		76.9	0	0
233	THERMAL SWITCH 1	229	1	Aluminum (generic)	Cylinder	0.0054	0.018	0.008		75.5	0	0
234	WIRE- 26 AWG- WHITE 2	229	1	Copper Alloy	Cylinder	0.0151	0.002	0.533		76.6	0	0
235	SUB ASSEMBLY- BAFFLE- OPTICS	1	1	Aluminum 6061-T6	Box	0.2526	0.146	0.188	0.019	76.6	0	0

236	BAFFLE- LWIR	235	1	Aluminum 6061-T6	Box	0.0128	0.057	0.057	0.016	76.2	0	0
237	BAFFLE- MWIR	235	1	Aluminum 6061-T6	Box	0.0105	0.051	0.051	0.016	76.2	0	0
238	BAFFLE- SWIR	235	1	Aluminum 6061-T6	Box	0.0097	0.044	0.044	0.016	76.1	0	0
239	BAFFLE- VISIBLE	235	1	Aluminum 6061-T6	Box	0.0111	0.051	0.051	0.016	76.2	0	0
240	BAFFLE- EXTERIOR	235	1	Aluminum 6061-T6	Box	0.1516	0.146	0.188	0.012	75.4	0	0
241	FHCS- PHILLIPS- 82 DEG- 2-56 X 1/4L- 18-8 SST	235	16	Stainless Steel (generic)	Cylinder	0.0001	0.002	0.006		76.2	0	0
242	CORD STOCK- .07OD- PTFE	235	1	PTFE	Cylinder	0.0032	0.002	0.556		76.6	0	0
243	SHCS- 4-40 X 5/16L- HRS- PASSIVATED 2	235	2	Steel A-286	Cylinder	0.0002	0.003	0.011		76.3	0	0
244	CABLE- TINI ACTUATOR- DOOR RELEASE	235	1	Copper Alloy	Cylinder	0.043	0.025	0.485		76.3	0	0
245	CONN- RCPT- HSG- 4 POS- 3.00 MM	244	1	Nylon	Box	0.0004	0.009	0.013	0.008	76.3	0	0
246	CONN- SOCKET- 26-30 AWG- CRIMP- GOLD 1	244	4	Copper Alloy	Cylinder	0.0001	0.013	0.004		76.3	0	0
247	WIRE- STRANDED- 26 AWG- PTFE- Black	244	1	Copper Alloy	Cylinder	0.0136	0.002	0.485		76	0	0
248	WIRE- STRANDED- 26 AWG- PTFE- RED	244	1	Copper Alloy	Cylinder	0.0136	0.002	0.485		76	0	0
249	ML50 Micro Latch	244	1	Stainless Steel (generic)	Cylinder	0.015	0.025	0.017		72.8	0	0
250	CABLE- SENSOR- FRONT BAFFLE	235	1	Copper Alloy	Cylinder	0.0087	0.003	0.432		76.4	0	0
251	CONN- MICROSTRIP SOCKET- 2POS- 26 AWG- SOLDER CUP- CENTER LATCH 2	250	1	LCP Thermoplastic	Box	0.0001	0.003	0.013	0.003	76.4	0	0
252	SENSOR- TEMPERATURE 10	250	1	Lead Element	Cylinder	0.0001	0.002	0.044		76.4	0	0
253	WIRE- 30 AWG- WHITE 10	250	1	Copper Alloy	Cylinder	0.0085	0.002	0.432		76.1	0	0
254	SUB ASSEMBLY- DEPLOYABLE COVER	1	1	Aluminum 6061-T6	Box	0.2339	0.147	0.188	0.008	76.5	0	0
255	SUB ASSEMBLY- HINGE	254	2	Aluminum 7075-T6	Box	0.0065	0.016	0.034	0.008	75.9	0	0
256	HINGE- MOUNT- TOP	255	1	Aluminum 7075-T6	Box	0.0026	0.01	0.024	0.008	75.3	0	0
257	HINGE- COVER- TOP	255	1	Aluminum 7075-T6	Box	0.0022	0.01	0.034	0.003	75.4	0	0
258	BUSHING- HINGE- PTFE 1	255	2	Teflon	Cylinder	0.00005	0.006	0.002		75.8	0	0
259	MICRO SPRING PLUNGER- 2mm OD SHAFT 1	255	1	Stainless Steel (generic)	Cylinder	0.0001	0.002	0.004		75.3	0	0
260	TORSION SPRING- .125 ID- 270DEG 1	255	1	Stainless Steel (generic)	Cylinder	0.0005	0.005	0.007		75	0	0
261	SHLDR SCR- 1/8OD X 5/8L- 4-40 THD- 18-8 SST 1	255	1	Stainless Steel (generic)	Cylinder	0.0009	0.003	0.016		74.6	0	0
262	CORD STOCK- .035 OD X .093 L- PTFE 1	255	1	Teflon	Cylinder	0.0001	0.004	0.004		75.8	0	0
263	SUB-ASSEMBLY- HINGE- BOTTOM	254	2	Aluminum 7075-T6	Box	0.007	0.022	0.034	0.008	75.9	0	0
264	HINGE- MOUNT- BOTTOM	263	1	Aluminum 7075-T6	Box	0.0027	0.013	0.022	0.008	75.4	0	0
265	HINGE- COVER- BOTTOM	263	1	Aluminum 7075-T6	Box	0.0027	0.01	0.034	0.003	75.3	0	0
266	BUSHING- HINGE- PTFE 2	263	2	Teflon	Cylinder	0.00005	0.006	0.002		75.9	0	0
267	MICRO SPRING PLUNGER- 2mm OD SHAFT 2	263	1	Stainless Steel (generic)	Cylinder	0.0001	0.002	0.004		75.3	0	0
268	TORSION SPRING- .125 ID- 270DEG 2	263	1	Stainless Steel (generic)	Cylinder	0.0005	0.005	0.007		75	0	0
269	SHLDR SCR- 1/8OD X 5/8L- 4-40 THD- 18-8 SST 2	263	1	Stainless Steel (generic)	Cylinder	0.0008	0.003	0.016		74.8	0	0
270	CORD STOCK- .035 OD X .093 L- PTFE 2	263	1	Teflon	Cylinder	0.0001	0.004	0.004		75.9	0	0
271	DEPLOYABLE COVER	254	1	Aluminum 6061-T6	Box	0.1637	0.147	0.188	0.005	75.1	0	0
272	SHCS- 2-56 X 3/16L- HRS- PASSIVATED 4	254	8	Steel A-286	Cylinder	0.0054	0.014	0.005		74.1	0	0
273	BUS- PUMPKIN	1	1	Aluminum 7075-T6	Box	10.8947	0.226	0.366	0.226	67.5	0	0
274	703-02409 EWS Hyperion RW400-50 Internal Bracket	273	1	Aluminum 6061-T6	Box	0.018	0.034	0.063	0.01	67	0	0
275	703-02330 RROCI 12U Base Plate	273	1	Aluminum 7075-T6	Box	0.414	0.239	0.365	0.007	66.2	0	0
276	703-02331 RROCI 12U Top Plate	273	1	Aluminum 6061-T6	Box	0.354	0.222	0.348	0.007	66.1	0	0
277	703-02332 RROCI 12U Side Plate +X	273	1	Aluminum 6061-T6	Box	0.434	0.198	0.348	0.012	65.9	0	0
278	703-02333 RROCI 12U Side Plate -X	273	1	Aluminum 6061-T6	Box	0.418	0.198	0.348	0.012	65.9	0	0
279	703-02335 RROCI 12U -Z Plate	273	1	Aluminum 6061-T6	Box	0.124	0.198	0.198	0.011	66.8	0	0
280	703-02334 RROCI 12U +Z Plate	273	1	Aluminum 6061-T6	Box	0.4499	0.198	0.206	0.01	64.5	0	0
281	McMaster 92320A462 Bushing #10 .312 OD .250L	273	2	Steel A-286	Cylinder	0.0015	0.008	0.006		66.8	0	0
282	Fastener Superstore 511020 M3x12mm Flat Torx	273	30	Steel A-286	Cylinder	0.0006	0.006	0.012		67.3	0	0
283	Fastener Superstore 511000 M3x8mm Flat Torx	273	26	Steel A-286	Cylinder	0.0004	0.006	0.008		67.3	0	0
284	EWS Radiator -Y Brackets	273	1	Aluminum 6061-T6	Box	0.1172	0.056	0.206	0.01	66.4	0	0
285	EWS Radiator +Y Brackets	273	1	Aluminum 6061-T6	Box	0.1172	0.056	0.206	0.01	66.4	0	0
286	EWS Radiator +X Brackets	273	1	Aluminum 6061-T6	Box	0.0634	0.025	0.185	0.007	66.5	0	0
287	EWS Radiator -X Brackets	273	1	Aluminum 6061-T6	Box	0.032	0.025	0.185	0.007	67	0	0
288	703-01485 SUPERNOVA 1U X-Z Cover	273	3	Aluminum 6061-T6	Box	0.0272	0.082	0.082	0.002	67	0	0
289	Fastener Superstore 510908 M2.5x4mm Flat Torx	273	4	Steel A-286	Cylinder	0.0002	0.005	0.004		67.3	0	0
290	M2.5x3.4 Undercut Flat Torx	273	16	Steel A-286	Cylinder	0.0002	0.005	0.003		67.3	0	0
291	EWS SAP Adapter X Hyperion SS200	273	1	Aluminum 6061-T6	Box	0.0213	0.082	0.082	0.002	67.1	0	0
292	SUPERNOVA 1U SS200 Cover	273	2	Aluminum 6061-T6	Box	0.0284	0.082	0.082	0.002	67	0	0
293	Solar Mechanism Assembly	273	1	Aluminum 6061-T6	Box	0.3204	0.214	0.353	0.02	66.7	0	0
294	DASA Gear Box (One sided)	293	2	Aluminum 7075-T6	Box	0.0173	0.088	0.127	0.02	66.5	0	0
295	703-0xxxx SUPERNOVA DASA Gear Box	293	1	Aluminum 7075-T6	Box	0.171	0.088	0.127	0.02	63.7	0	0
296	710-01757 DASA SupMCU	293	1	Fiberglass	Box	0.0124	0.081	0.102	0.003	66.5	0	0

297	DASA Pin-Puller	293	1	Aluminum 7075-T6	Cylinder	0.0346	0.032	0.032		64.6	0	0
298	DASA Motor Control Sub-Assy	293	2	Fiberglass	Box	0.0185	0.04	0.074	0.011	66.3	0	0
299	Tri-Lobe Limit Stop	293	1	Titanium (6 Al-4 V)	Box	0.0013	0.008	0.024	0.004	0	0.37	0.15
300	DASA Panel Mount	293	1	Aluminum 6061-T6	Box	0.0083	0.015	0.02	0.011	65.5	0	0
301	DASA Gear Box 15mm Faulhaber Mount	293	1	Aluminum 7075-T6	Box	0.0212	0.027	0.047	0.02	65.8	0	0
302	DASA Triple Panel Set	273	2	Fiberglass	Box	0.787	0.214	0.353	0.011	66.1	0	0
303	SpectroLab Cell 043575	302	63	Germanium	Box	0.0036	0.04	0.068	0.001	65.9	0	0
304	705-01742 LIC Deployable Panel Root	302	1	Fiberglass	Box	0.187	0.214	0.353	0.002	0	0.63	10.3
305	705-01743 LIC Deployable Wing	302	2	Fiberglass	Box	0.1496	0.214	0.331	0.002	0	1.25	7.02
306	703-01184 Hinge- Panel Right 90- Pinpuller PRM	302	2	Aluminum 7075-T6	Box	0.0015	0.006	0.023	0.005	65.7	0	0
307	703-01183 Hinge- Panel- Left- 90- Pinpuller PRM	302	2	Aluminum 7075-T6	Box	0.0015	0.006	0.023	0.005	65.7	0	0
308	703-01718 DASA Hinge Bracket Right	302	1	Aluminum 7075-T6	Box	0.0058	0.012	0.087	0.011	65.8	0	0
309	703-01717 DASA Hinge Bracket Left	302	1	Aluminum 7075-T6	Box	0.0058	0.012	0.087	0.011	65.8	0	0
310	703-01188 Spring- SUPERNOVA Panels	302	4	Steel A-286	Box	0.0005	0.006	0.008	0.002	65.6	0	0
311	703-01716 DASA Panel Brace	302	2	Aluminum 7075-T6	Box	0.0031	0.021	0.067	0.001	65.9	0	0
312	703-01823 DASA Panel- Nutbar	302	2	Aluminum 7075-T6	Box	0.0015	0.011	0.061	0.01	66	0	0
313	McMaster 92010A003 M2x6mm Flat Head Screw	302	8	Steel A-286	Cylinder	0.0002	0.004	0.006		65.8	0	0
314	703-01221 Button- Deployable .050	302	36	Ultem 1000	Cylinder	0.0001	0.005	0.004		66.1	0	0
315	703-01821 15mm Panel Dowel Pin Bracket	302	2	Aluminum 7075-T6	Box	0.0007	0.01	0.015	0.004	65.9	0	0
316	703-01196 SUPERNOVA Panel Strap	302	2	Aluminum 7075-T6	Box	0.0002	0.005	0.015	0.001	66	0	0
317	McMaster 92010A001 M2x4mm Flat Head Screw	302	4	Steel A-286	Cylinder	0.0001	0.004	0.004		65.9	0	0
318	McMaster 97395A432 Dowel Pin 3/32" OD x 5/8" L	302	2	Steel AISI 316	Cylinder	0.0005	0.003	0.01		65.5	0	0
319	McMaster 92605A097 Set Screw M3x3mm	302	2	Steel A-286	Cylinder	0.0002	0.004	0.003		65.7	0	0
320	Locking Side Hinge- 180 Set	302	4	Aluminum 7075-T6	Box	0.0089	0.018	0.073	0.006	65.5	0	0
321	McMaster 92010A002 M2x5mm Flat Head Screw	302	8	Steel A-286	Cylinder	0.0001	0.004	0.005		65.9	0	0
322	Hyperion iADCS400	273	1	Aluminum 6061-T6	Box	1.5889	0.095	0.096	0.066	54.8	0	0
323	Hyperion ST200T with 45 Degree Baffle	273	1	Aluminum 6061-T6	Cylinder	0.055	0.031	0.061		66.1	0	0
324	703-02341 EWS ST200-Y Bracket	273	1	Aluminum 6061-T6	Box	0.047	0.039	0.054	0.033	66.6	0	0
325	SUPERNOVA Stack Extender	273	1	Aluminum 6061-T6	Box	0.0382	0.1	0.1	0.006	67	0	0
326	703-02351 EWS iADCS400 Top Bracket	273	1	Aluminum 6061-T6	Box	0.0567	0.1	0.1	0.027	66.9	0	0
327	703-02350 SUPERNOVA StackAdapter XLINK	273	1	Aluminum 6061-T6	Box	0.07	0.1	0.1	0.006	66.5	0	0
328	710-00908 GPSRM 1	273	1	Fiberglass	Box	0.109	0.09	0.096	0.016	66.6	0	0
329	710-01725 EPSM 1	273	1	Fiberglass	Box	0.2	0.09	0.096	0.02	65.9	0	0
330	710-01362 Motherboard Module 2	273	1	Fiberglass	Box	0.095	0.09	0.096	0.019	66.8	0	0
331	710-01390 Bus Interface Module	273	1	Fiberglass	Box	0.107	0.09	0.096	0.017	66.6	0	0
332	710-01391 Payload Interface Module	273	1	Fiberglass	Box	0.043	0.09	0.096	0.015	67.2	0	0
333	629-00876-1.31 M3 Standoff 1.31mm	273	4	Aluminum 6061-T6	Cylinder	0.0001	0.006	0.002		67.4	0	0
334	629-00876-16.24 M3 Standoff 16.24mm	273	8	Aluminum 6061-T6	Cylinder	0.0009	0.007	0.016		67.3	0	0
335	703-0xxxxx Standoff- Hex- Stepped- F-F M3x15.24mm	273	4	Aluminum 6061-T6	Cylinder	0.001	0.007	0.015		67.3	0	0
336	634-00909-7 M3 Standoffs 7mm	273	4	Aluminum 6061-T6	Cylinder	0.0004	0.006	0.007		67.3	0	0
337	703-01901 SUPERNOVA Stack Adapter C	273	1	Aluminum 7075-T6	Box	0.0353	0.1	0.1	0.006	67.1	0	0
338	Helicoil M3 1.5D	273	12	Steel AISI 316	Cylinder	0.0002	0.003	0.005		67.3	0	0
339	McMaster 91801A620 M3x25mm	273	4	Steel A-286	Cylinder	0.0012	0.006	0.025		67.3	0	0
340	Fastener Superstore 511031 M3x16mm Flat Torx	273	6	Steel A-286	Cylinder	0.0008	0.006	0.016		67.3	0	0
341	710-01848 Radio Host Module 2	273	1	Fiberglass	Box	0.0558	0.09	0.096	0.017	67.1	0	0
342	IQ Wireless XLINK Transceiver	273	1	Aluminum 6061-T6	Box	0.1734	0.065	0.09	0.025	65.3	0	0
343	710-02113 SUPERNOVA Sep Switch Assembly	273	1	Fiberglass	Box	0.0212	0.025	0.062	0.022	67.2	0	0
344	710-02404 5-6 Switch GSIM GSIM	273	1	Fiberglass	Box	0.028	0.025	0.087	0.024	67.2	0	0
345	710-02375 SUPERNOVA 5-6 Switch IBG Cover	273	1	Aluminum 6061-T6	Box	0.0104	0.022	0.057	0.007	67.1	0	0
346	EWS PDB	273	1	Fiberglass	Box	0.0282	0.092	0.095	0.008	67.3	0	0
347	710-01552 Battery Module 2	273	2	Aluminum 6061-T6	Box	0.502	0.089	0.093	0.044	62.5	0	0
348	703-02379 EWS BM 2 Mounting Plate	273	1	Aluminum 6061-T6	Box	0.152	0.104	0.205	0.014	66.5	0	0
349	703-02309 EWS BM 2 -Y Bracket	273	1	Aluminum 6061-T6	Box	0.0267	0.017	0.101	0.011	66.8	0	0
350	703-02307 EWS BM 2 +Y Bracket	273	1	Aluminum 6061-T6	Box	0.0267	0.017	0.101	0.011	66.8	0	0
351	703-02321 BM 2 Dual Battery Core	273	1	Aluminum 6061-T6	Box	0.105	0.056	0.172	0.01	66.4	0	0
352	Antcom L1 GPS 1.5G15X-XNX-X GPS Antenna	273	1	Aluminum 6061-T6	Box	0.0468	0.04	0.04	0.011	65.7	0	0
353	NSL Simplex Antenna	273	1	Fiberglass	Box	0.015	0.026	0.045	0.007	67.1	0	0
354	MPT4.2C Assembly	273	1	Aluminum 6061-T6	Box	2.1	0.142	0.191	0.067	57.9	0	0
355	RADIATOR- OPTICS- LEFT	1	1	Aluminum 6061-T6	Box	0.2989	0.187	0.187	0.004	76	0	0
356	RADIATOR- OPTICS- RIGHT	1	1	Aluminum 6061-T6	Box	0.2989	0.187	0.187	0.004	76	0	0
357	RADIATOR- OPTICS- TOP	1	1	Aluminum 6061-T6	Box	0.3397	0.187	0.187	0.008	75.8	0	0

358	RADIATOR- ELECTRONICS	1	1	Aluminum 6061-T6	Box	0.2976	0.187	0.187	0.003	76	0	0
359	SPACER- BAFFLE	1	8	Fiberglass	Cylinder	0.0003	0.01	0.004		77.8	0	0
360	SPACER- RADIATOR	1	19	Fiberglass	Cylinder	0.0003	0.01	0.004		77.8	0	0
361	WASHER- RADIATOR	1	27	Fiberglass	Cylinder	0.0001	0.01	0.003		77.9	0	0
362	SPACER- RADIATOR- ALUMINUM	1	8	Aluminum 6061-T6	Cylinder	0.0005	0.01	0.012		77.8	0	0
363	FMS- 6-32 X 3/8L- OFFSET CRUCIFORM- A286	1	32	Steel A-286	Cylinder	0.0077	0.009	0.015		75.4	0	0
364	FMS- 6-32 X 1/2L- OFFSET CRUCIFORM- A286 1	1	27	Steel A-286	Cylinder	0.0077	0.009	0.015		75.4	0	0
365	FMS- 6-32 X 5/8L- OFFSET CRUCIFORM- A286	1	13	Steel A-286	Cylinder	0.0077	0.009	0.016		75.5	0	0
366	FMS- 4-40 X .375L- OFFSET CRUCIFORM- A286	1	21	Steel A-286	Cylinder	0.005	0.009	0.01		75.7	0	0
367	FHCS- 82 DEG- T15 TORX DRIVE- 6-32 X .5L- HRS- PASSIVATED	1	8	Stainless Steel (generic)	Cylinder	0.0077	0.01	0.013		74.8	0	0
368	SHCS- M2 X 0.4 X 8mm L- HRS- PASSIVATED	1	8	Steel A-286	Cylinder	0.0064	0.01	0.01		75.4	0	0
369	FMS- 6-32 X 1/2L- OFFSET CRUCIFORM- A286 2	1	10	Steel A-286	Cylinder	0.0041	0.007	0.013		76	0	0
370	SHCS- M2 X .4 X 5mm L- HRS- PASSIVATED	1	4	Steel A-286	Cylinder	0.0059	0.01	0.01		75.6	0	0
371	FHCS- HEX- 82 DEG 4-40 X 1/2L- A286	1	12	Steel A-286	Cylinder	0.0041	0.007	0.013		76	0	0
372	CABLE- SPACECRAFT TO PAYLOAD	1	1	Copper Alloy	Cylinder	0.0032	0.023	0.198		78	0	0
373	CABLE- POWER- SPACECRAFT TO PAYLOAD	1	1	Copper Alloy	Cylinder	0.1104	0.009	0.196		75.9	0	0
374	CONN- D-SUB HD PLUG- 31P- SLDR CUP	373	1	Copper Alloy	Box	0.0009	0.006	0.006	0.006	75.4	0	0
375	CONN- RCPT- 10 POS- 2mm- DUAL ROW	373	3	Copper Alloy	Cylinder	0.0001	0.003	0.002		75.7	0	0
376	CONN SOCKET- 26-28 AWG- CRIMP- GOLD	373	30	Copper Alloy	Cylinder	0.0001	0.003	0.002		75.7	0	0
377	CONN- RCPT- 8POS- 2mm- DUAL ROW 1	373	1	Copper Alloy	Cylinder	0.0001	0.003	0.002		75.7	0	0
378	CONN- RCPT- 10POS- J-TEK	373	1	Copper Alloy	Cylinder	0.0002	0.004	0.003		75.7	0	0
379	WIRE- 24 AWG- PTFE- RED 1	373	1	Copper Alloy	Cylinder	0.0146	0.003	0.381		75.6	0	0
380	WIRE- 24 AWG- PTFE- BLACK 1	373	1	Copper Alloy	Cylinder	0.052	0.003	1.382		75.6	0	0
381	WIRE- 24 AWG- PTFE- YELLOW	373	1	Copper Alloy	Cylinder	0.0146	0.003	0.381		75.6	0	0
382	WIRE- 24 AWG- PTFE- ORANGE	373	1	Copper Alloy	Cylinder	0.013	0.003	0.338		75.6	0	0
383	WIRE- 24 AWG- PTFE- WHITE	373	1	Copper Alloy	Cylinder	0.0108	0.003	0.282		75.6	0	0
384	CABLE- SURVIVAL HEATER	1	1	Copper Alloy	Cylinder	0.0694	0.016	0.04		74.3	0	0
385	CONN- RCPT- 8POS- 2mm- DUAL ROW 2	384	1	Copper Alloy	Cylinder	0.0011	0.006	0.005		73.8	0	0
386	OPTICS BENCH SURVIVAL HEATER	384	1	Polyamide	Box	0.0005	0.007	0.008	0.006	74.3	0	0
387	THERMAL SWITCH 2	384	1	Aluminum (generic)	Cylinder	0.0054	0.02	0.007		73.3	0	0
388	WIRE- 24 AWG- PTFE- BLACK 2	384	1	Copper Alloy	Cylinder	0.0312	0.003	0.813		74.1	0	0
389	WIRE- 24 AWG- PTFE- RED 2	384	1	Copper Alloy	Cylinder	0.0312	0.003	0.813		74.1	0	0
390	CABLE- SENSOR-CAMERA POWER-MOTOR (incomplete)	1	1	Aluminum 6061-T6	Box	0.0018	0.011	0.034	0.008	77.8	0	0
391	CABLE- CAMERA LINK- MWIR	1	1	Aluminum 6061-T6	Box	0.0449	0.03	0.04	0.015	75.8	0	0
392	CONN- MICRO-D- SOCKET- 25POS- SOLDER CUP	391	2	Aluminum (generic)	Cylinder	0.0222	0.023	0.02		73.4	0	0
393	WIRE- 26 AWG- FEP- TWINAX 1	391	1	Copper Alloy	Cylinder	0.0005	0.001	0.184		75.7	0	0
394	CABLE- CAMERA LINK- VISIBLE (incomplete)	1	1	Copper Alloy	Cylinder	0.0181	0.005	0.104		77	0	0
395	CABLE- RF- X-BAND XCVR- BUS	1	1	Copper Alloy	Cylinder	0.0072	0.003	0.24		77.7	0	0
396	CONN SMP JACK STR 50 OHM CRIMP 2	395	1	Copper Alloy	Cylinder	0.0014	0.005	0.016		77.3	0	0
397	CONN- MMCX PLUG- RA- 50 OHM- SOLDER 3	395	1	Aluminum (generic)	Box	0.001	0.007	0.018	0.003	77.3	0	0
398	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 5	395	1	Copper Alloy	Cylinder	0.0048	0.003	0.323		77.6	0	0
399	CABLE- RF- S-BAND ANT- BUS XCVR	1	1	Copper Alloy	Cylinder	0.0107	0.008	0.472		77.9	0	0
400	CONN SMP JACK STR 50 OHM CRIMP 3	399	1	Copper Alloy	Cylinder	0.0014	0.005	0.016		77.4	0	0
401	CONN SMA PLUG R/A 50 OHM SOLDER 2	399	1	Copper Alloy	Cylinder	0.0023	0.008	0.029		77.6	0	0
402	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 6	399	1	Copper Alloy	Cylinder	0.007	0.003	0.472		77.8	0	0
403	CABLE- CAMERA LINK- LWIR	1	1	Aluminum 6061-T6	Box	0.0549	0.03	0.035	0.02	75.3	0	0
404	CONN- MICRO-D- SOCKET- 21POS- SOLDER CUP 1	403	2	Aluminum (generic)	Cylinder	0.02225	0.025	0.02		73.2	0	0
405	WIRE- 26 AWG- FEP- TWINAX 2	403	1	Copper Alloy	Cylinder	0.0104	0.003	0.165		74.8	0	0
406	CABLE- CAMERA LINK- SWIR	1	1	Aluminum (generic)	Box	0.0386	0.025	0.035	0.02	75.8	0	0
407	CONN- MICRO-D- SOCKET- 21POS- SOLDER CUP 2	406	2	Aluminum (generic)	Cylinder	0.01905	0.025	0.015		73.6	0	0
408	WIRE- 26 AWG- FEP- TWINAX 3	406	1	Copper Alloy	Cylinder	0.0005	0.001	0.104		75.7	0	0
409	CABLE- SC TO PAYLOAD- ETHERNET (incomplete)	1	1	Copper Alloy	Cylinder	0.0009	0.001	0.19		77.9	0	0
410	CABLE- OM SENSORS TO PUMPKIN BIM	1	1	Copper Alloy	Cylinder	0.0098	0.002	0.419		77.7	0	0
411	CONN- 4 POS- SINGLE ROW- 1.25mm SPACE	410	3	Polyamide	Box	0.0004	0.006	0.012	0.004	77.6	0	0
412	CONN- SOCKET- 26-30 AWG- CRIMP- GOLD 2	410	12	Copper Alloy	Cylinder	0.00045	0.004	0.005		77.3	0	0
413	CONN- MICROSTRIP PIN- 26 AWG- SOLDER CUP- CENETR LATCH	410	3	LCP Thermoplastic	Box	0.0001	0.005	0.013	0.003	77.7	0	0
414	WIRE- 2 COND- 30 AWG	410	1	Copper Alloy	Cylinder	0.0029	0.001	1.321		77.7	0	0
415	CABLE- PUMPKIN GPSRM PPS TO DMS	1	1	Copper Alloy	Cylinder	0.0076	0.002	0.267		77.7	0	0
416	CONN- MMCX PLUG- RA- 50 OHM- SOLDER 4	415	1	Stainless Steel (generic)	Cylinder	0.0018	0.004	0.018		76.3	0	0
417	CONN- MCX PLUG- RA- 50 OHM- SOLD	415	1	Stainless Steel (generic)	Cylinder	0.0018	0.004	0.018		76.3	0	0
418	FLEXIBLE RG316 COAX 50 OHM FEP JACKET 7	415	1	Copper Alloy	Cylinder	0.004	0.003	0.267		77.5	0	0

419	CABLE- SENSOR- TOP RADIATOR	1	1	Copper Alloy	Cylinder	0.0144	0.004	0.21		77.5	0	0
420	CONN- MICROSTRIP- SOCKET- 2POS- 26AWG- SOLDER CUP- CENTERLATCH 2	419	1	LCP Thermoplastic	Box	0.0001	0.003	0.013	0.003	77.5	0	0
421	SENSOR- TEMPERATURE 11	419	1	Copper Alloy	Cylinder	0.0059	0.015	0.008		76.4	0	0
422	WIRE- STRANDED- 30 AWG- PTFE- BLACK	419	1	Copper Alloy	Cylinder	0.0042	0.002	0.21		77.3	0	0
423	WIRE- STRANDED- 30 AWG- PTFE- WHITE 1	419	1	Copper Alloy	Cylinder	0.0042	0.002	0.21		77.3	0	0
424	CABLE- SENSOR- PEM RADIATOR	1	1	Copper Alloy	Cylinder	0.001	0.002	0.051		77.8	0	0
425	CONN- MICROSTRIP- SOCKET- 2POS- 26AWG- SOLDER CUP- CENTERLATCH 3	424	1	LCP Thermoplastic	Box	0.0001	0.003	0.013	0.003	77.8	0	0
426	Thermistor 2	424	1	Lead Element	Cylinder	0.0001	0.002	0.044		77.8	0	0
427	WIRE- STRANDED- 30 AWG- PTFE- WHITE 2	424	1	Copper Alloy	Cylinder	0.0008	0.002	0.051		77.6	0	0
428	CABLE- SENSOR- SC PAYLOAD CAVITY	1	1	Copper Alloy	Cylinder	0.001	0.002	0.051		77.8	0	0
429	CONN- MICROSTRIP SOCKET- 2POS- 26 AWG- SOLDER CUP- CENTER LATCH 3	428	1	LCP Thermoplastic	Box	0.0001	0.003	0.013	0.003	77.8	0	0
430	Thermistor 3	428	1	Lead Element	Cylinder	0.0001	0.002	0.044		77.8	0	0
431	WIRE- STRANDED- 30 AWG- PTFE- WHITE 3	428	1	Copper Alloy	Cylinder	0.0008	0.002	0.051		77.6	0	0