



HaWK 17A-42

Our innovative HaWK solar array is a high performance 42 Watt solar array system for the CubeSat class spacecraft. The system consists of two array wings (center panel with 2 flip-out panels per wing), launch restraint mechanism and single-axis pancake solar array drive assembly (SADA*) for improved orbital average power (OAP). The HaWK array wings are designed to interface in both a gimbal or a non-gimbaled configuration without interface /configuration changes. The complete array system is stowed for launch and released after power is applied to a melt-rod release mechanism. Deployment of the flip-out panels and wings is accomplished using stored energy provided by springs. If the mission requires, the sun-tracking single-axis SADA is used to track the sun's position and provide maximum OAP. The HaWK solar array was developed under Air Force Research Laboratory (AFRL) funding.

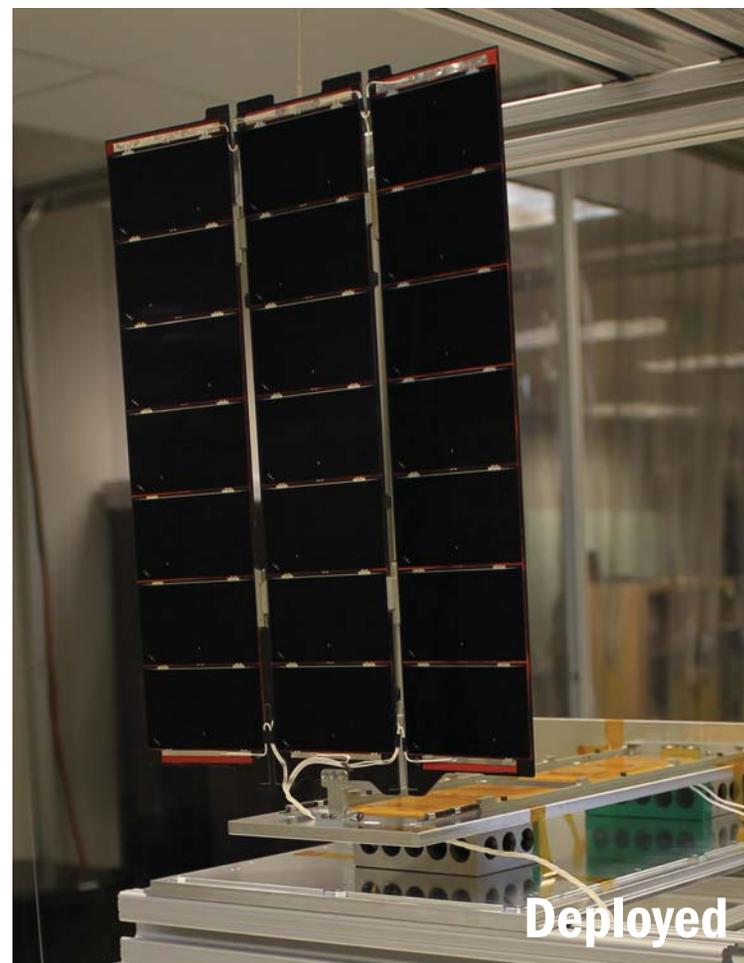
In 2017, the HaWK achieved flight heritage, and a similar version of HaWK is flying on the interplanetary mission, MarCO.

Key characteristic:

- Uncropped cells

**SADA is optional and may require interface/configuration changes.*

*Learn more about MMA's gimbals at:
www.mmadesignllc.com/products/gimbals/*



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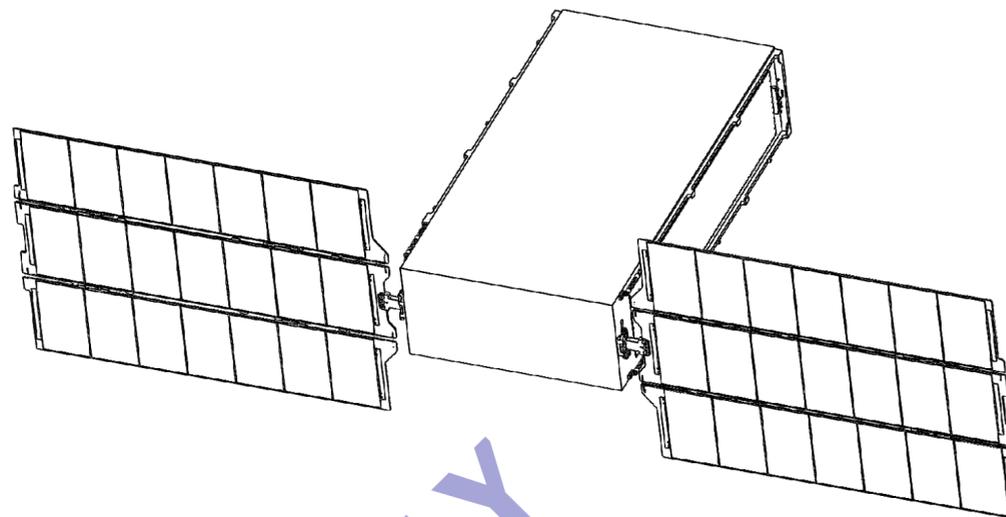
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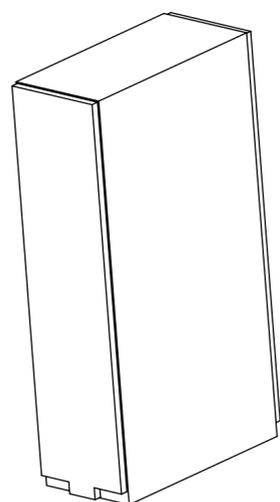
REVISION	
REV	ECN
N/A	N/A

NOTES:

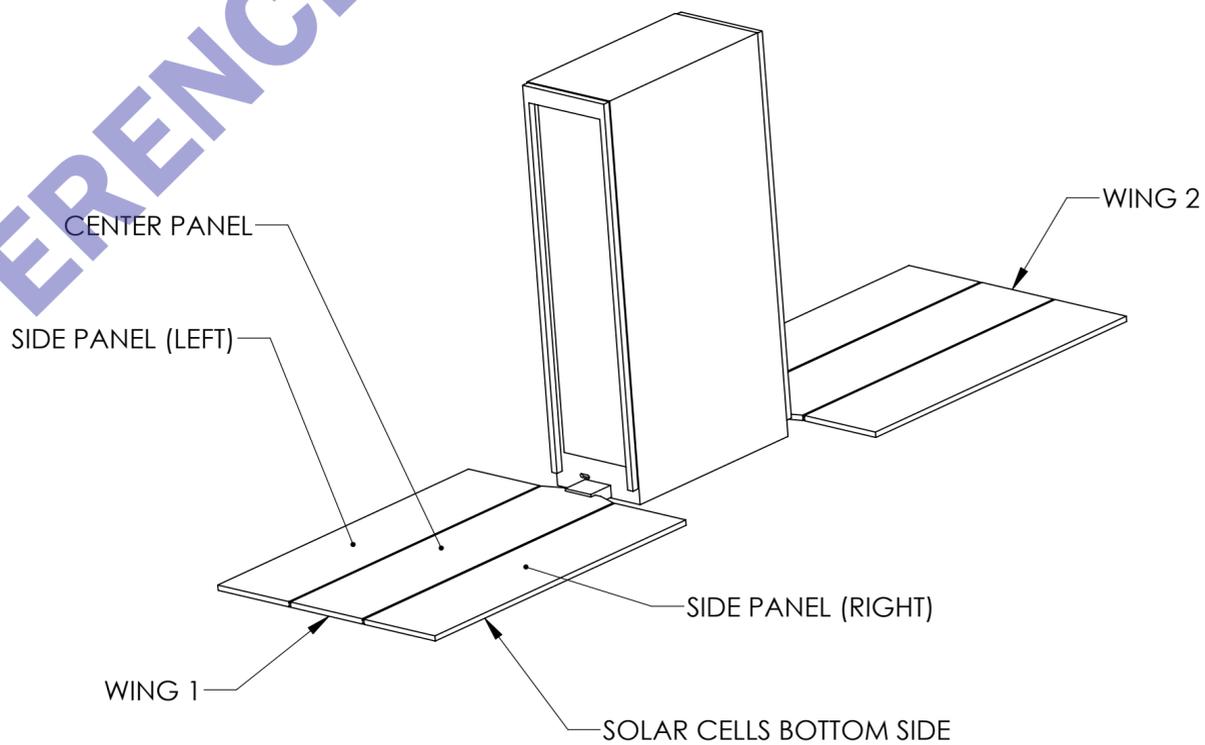
1. THIS DRAWING IS NOT TO BE USED FOR FABRICATION.
2. ALL DIMENSIONS APPLY TO STATIC ENVELOPES ONLY.
3. APPROXIMATE MASS INCLUDING LAUNCH CAGE, HDRM, AND WIRING = 175GM PER WING.



REFERENCE DEPLOYED VIEW



STOWED ENVELOPE



DEPLOYED ENVELOPE

FOR REFERENCE ONLY

INTERFACE CONTROL DRAWING

UNLESS OTHERWISE SPECIFIED:
 LINEAR DIMENSIONS ARE IN INCHES

TOLERANCES:
 .XX = ±.01
 .XXX = ±.005
 .XXXX = ±.0002
 X° = ±1°

BREAK SHARP EDGES .005 - .015

INTERPRET DRAWING PER:
 ASME Y14.5M-1994

SURFACE TEXTURE:
 125 MICROROUGH

THIRD ANGLE

DRAWN BY _____ DATE _____

ENGINEER _____

SEE CM DATABASE FOR DRAWING AND CHANGE APPROVALS

		2000 Taylor Ave, Ste 200 Louisville, CO 80027	
ICD, 17A-42			
SIZE	CAGE CODE	DWG. NO.	REV:
C	50JD9	17A-42	N/A
SCALE	DO NOT SCALE DRAWING		SHEET 1 of 3
1:4			

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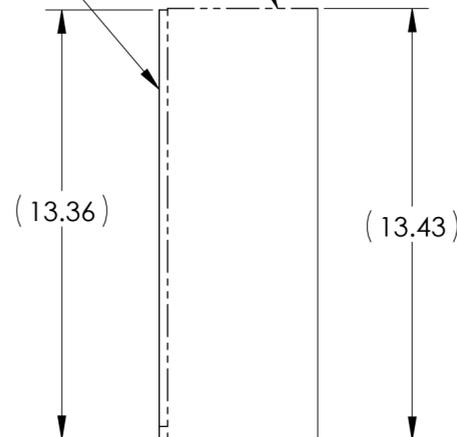
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SPACECRAFT ENVELOPE

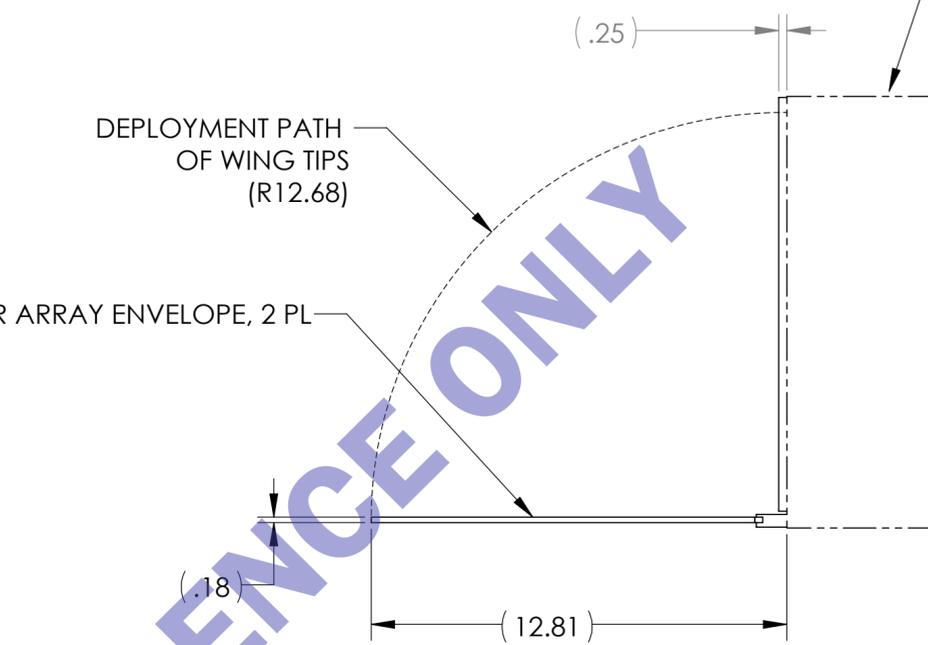
SPACECRAFT ENVELOPE

SOLAR ARRAY ENVELOPE, 2 PL



DEPLOYMENT PATH OF WING TIPS (R12.68)

SOLAR ARRAY ENVELOPE, 2 PL

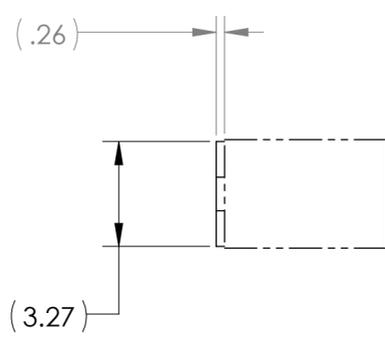


C

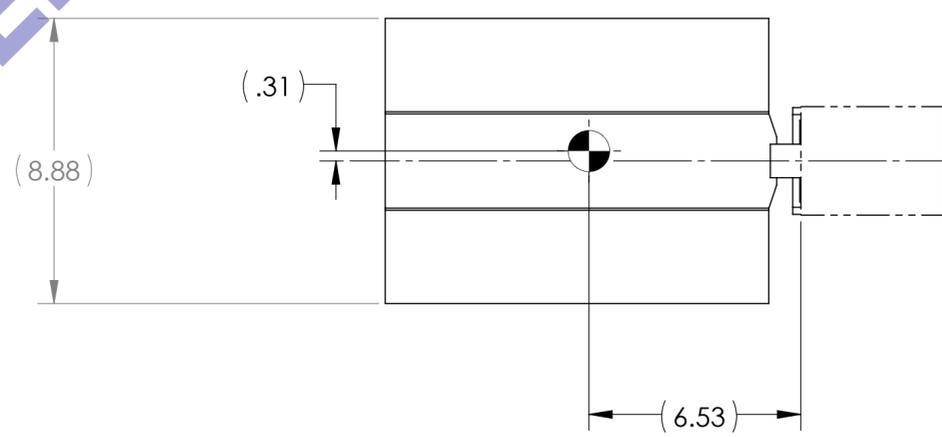
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B

B



STOWED VIEW - EACH WING



DEPLOYED VIEW - EACH WING

FOR REFERENCE ONLY

A

A

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INTERFACE CONTROL DRAWING

SIZE C	CAGE CODE 50JD9	DWG. NO. 17A-42	REV. N/A
SCALE 1:4	DO NOT SCALE DRAWING		SHEET 2 of 3

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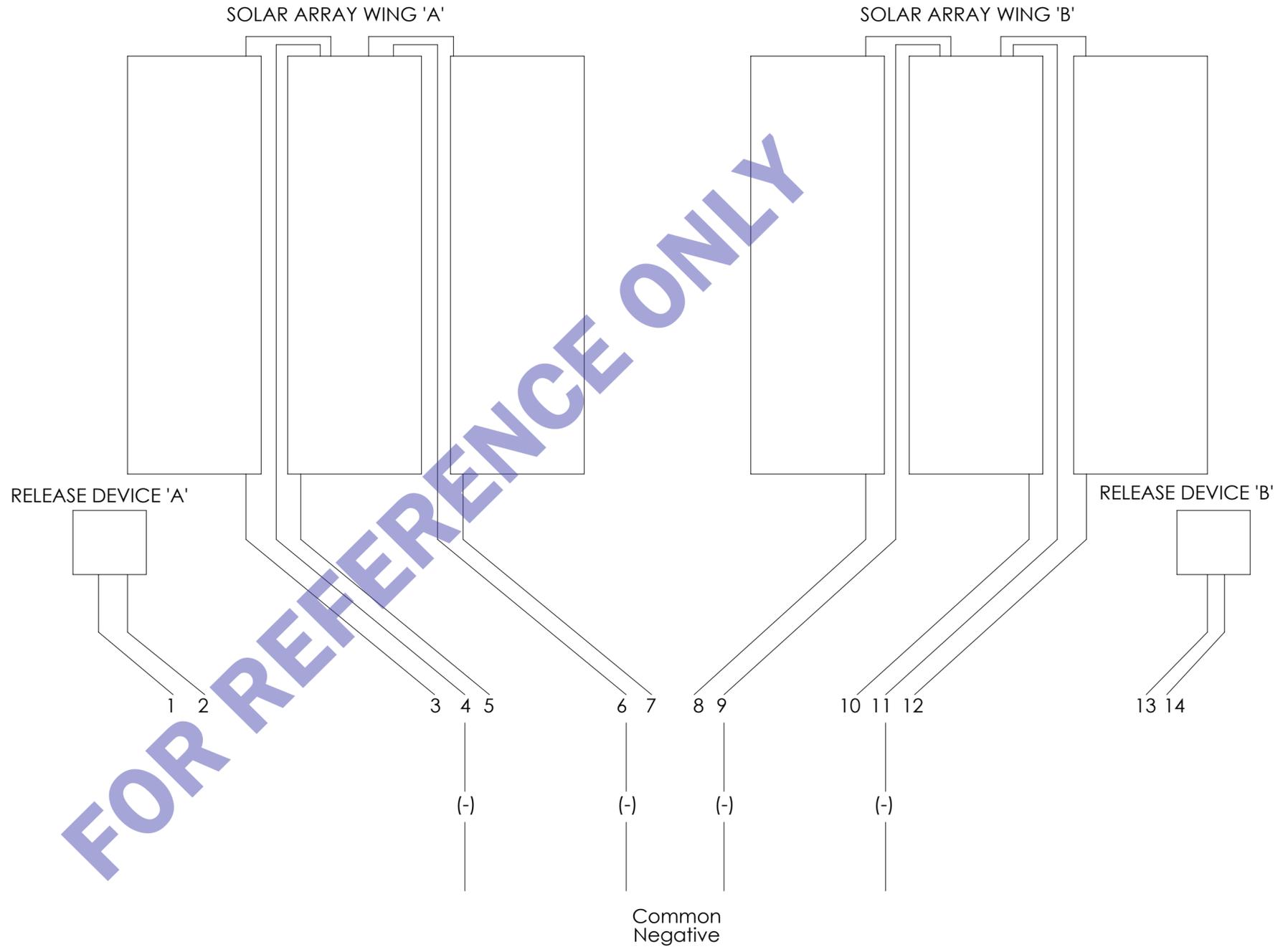
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NOTES:

- 1. 24 INCH MINIMUM FLYING LEAD LENGTH.
- 2. FLYING LEADS TO BE TAGGED PER TABLE 1.



FOR REFERENCE ONLY

TABLE 1

Flying Lead	Assignment
1	Burn Wire (Wing A)
2	Burn Wire Return (Wing A)
3	Wing A Side Panel Power
4	Wing A Return #1
5	Wing A Center Panel Power
6	Wing A Return #2
7	Wing A Side Panel Power
8	Wing B Side Panel Power
9	Wing B Return #1
10	Wing B Center Panel Power
11	Wing B Return #2
12	Wing B Side Panel Power
13	Burn Wire (Wing B)
14	Burn Wire Return (Wing B)

INTERFACE CONTROL DRAWING

SIZE C	CAGE CODE 50JD9	DWG. NO. 17A-42	REV. N/A
SCALE 16:1	DO NOT SCALE DRAWING		SHEET 3 of 3

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Existing HaWK Configurations

Wing		Array Performance		W/kg (w/o SADA)		Stowed Height (mm)	MMA HaWK Part Number	
Stowed Footprint (U)	Deployment Axis	Config	Peak Power (BOL, AM0, 28C)	Standard	High-Perf			
1x3	α	2 wings	42 W	99	127	7	17A-42	
	$\alpha + \beta(90deg)$	2 wings	36 W	96	129	6.5	17AB42	
	$\alpha + SADA(\beta)$	2 wings	42 W	99	127	6.5	17AS42	
	$\alpha(long) z-fold$	2 wings	56 W	91	155	8.5	17AS56	
2x3	V-Panel	α	2 wings	84 W	90	117	9.7	27A-84V
	Flat Panel	α	2 wings	42 W	54	NA	4	27A-42R
		$\alpha + SADA(\beta)$	2 wings	112 W	97	121	11	27AS112
		$\alpha(short) + body$	2 wings + body	42 W	35		15	27A-42BE
		$\alpha(long) + body$	2 wings + body	50 W	60		9.7	27L-50B
ESPA and larger	Boom-deployed + SADA (β)	Multi-panel	"~500 W-6 kW"	100-130		115	rHaWK	
2x3	$\alpha / \alpha+SADA(\beta)$	high voltage	>112 W	TBD	TBD	TBD	hvHaWK	

* Many of the above configurations may be combined to realize more power.

MMA PART NUMBER DECODER

W	L	1	2	PP	R	O
Stowed Footprint Width (1-1U, 2=2U)	String Length	Deployment Axis #1 (A=Alpha Hinge, L=Long Side Alpha Hinge)	Deployment Axis #2 (-=None, B=Beta Hinge, S=SADA)	Peak Power (@ BOL, AM0, 28C)	Restraint (Blank = Standard, F=Frangibolt, E=ERM, R=Roller)	Options (Blank = None, B = Body Panel, V = V-Panel, HP = High Performance)