Approved by OMB 3060-0678
Estimated Burden: up to 80 hours
April 2016

Federal Communications Commission

312 File Number: **SATMOD2024061900139**

Filing Description

Question	Response
Description	Hawkeye 360-Lite (Kestrel-0A)

Satellite Information

Question	Response
Select Orbit Type	NGSO
Space Station or Satellite Network Name	HawkEye 360
Estimated Lifetime of Satellite(s) From Date of Launch	5 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating Frequency Bands (7)

Nature of service	Description	Frequency Band (s)	Mode Type
Other Satellite Service (please specify)	Inter-Satellite Service	1618.725 MHz -1626.5 MHz	Transmit
Other Satellite Service (please specify)	Inter-Satellite Service	1618.725 MHz -1626.5 MHz	Receive
Earth Exploration-Satellite Service		1087.7 MHz -1092.3 MHz	Receive
Earth Exploration-Satellite Service		406.0 MHz -406.1 MHz	Receive
Earth Exploration-Satellite Service		156.5 MHz -162.5 MHz	Receive
Earth Exploration-Satellite Service		2025.0 MHz -2110.0 MHz	Receive
Earth Exploration-Satellite Service		8025.0 MHz -8400.0 MHz	Transmit

Orbital Information For Non-Geostationary Satellites

Question	Response
Total Number of Satellites in the active constellation	1
Orbit Epoch Date	01/01/2024
Celestrial Reference Body	Earth

Orbital Plane 1:

Question	Response
Number of Satellites in Plane	1
Inclination Angle	97.5 degrees
Right Ascension of Ascending Node	0.0 degrees
Argument of Perigee	0.0 degrees
Orbital Period	5689.0 seconds
Apogee	510.0 km
Perigee	510.0 km
Active Service Arc Begin Angle with respect to Ascending Node	-90.0 degrees
Active Service Arc End Angle with respect to Ascending Node	90.0 degrees

Mean Anomaly For Each Satellite

Satellite Number	Mean Anomaly (degrees) at the Orbit Epoch Date
1	0.0

Receiving Beams 1:

Question	Response
Beam ID	ISL1
Receive Beam Frequency	1618.725 MHz -1626.5 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	4.5 dBi
Antenna Pointing Error	0.1 degrees
Antenna Rotational Error	0.1 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-17.3 dB/K
Min. Saturation Flux Density	-999.0 dBW/m2
Max. Saturation Flux Density	-998.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global

Receiving Beams 2:

Question	Response
Beam ID	PAYU
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	6.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees

Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-22.0 dB/K
Min. Saturation Flux Density	-116.2 dBW/m2
Max. Saturation Flux Density	-79.6 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Receiving Beams 3:

Question	Response
Beam ID	TTCU
Receive Beam Frequency	2025.0 MHz -2110.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.4 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-24.6 dB/K
Min. Saturation Flux Density	-111.9 dBW/m2
Max. Saturation Flux Density	-79.6 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Receiving

Beams 4:

Question	Response
Beam ID	AIS
Receive Beam Frequency	156.5 MHz -162.5 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	2.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	-27.4 dB/K
Min. Saturation Flux Density	-135.3 dBW/m2
Max. Saturation Flux Density	-107.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Receiving Beams 5:

Question	Response
Beam ID	DSC
Receive Beam Frequency	156.512 MHz -156.538 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	2.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	

Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	-27.4 dB/K
Min. Saturation Flux Density	-131.3 dBW/m2
Max. Saturation Flux Density	-113.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Receiving Beams 6:

Question	Response
Beam ID	EPRB
Receive Beam Frequency	406.0 MHz -406.1 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	2.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	-26.5 dB/K
Min. Saturation Flux Density	-130.3 dBW/m2
Max. Saturation Flux Density	-116.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Receiving Beams 7:

Question	Response
Beam ID	ADSB

Receive Beam Frequency	1087.7 MHz -1092.3 MHz
Beam Type	Fixed
Polarization	H
Peak Gain	5.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	0.0 degrees
G/T at Max. Gain Point	-21.5 dB/K
Min. Saturation Flux Density	-122.4 dBW/m2
Max. Saturation Flux Density	-101.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Receiving Channels (12)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
AIS4	0.025	156.825	Service Link
PU36	1.33	2049.3	TT&C
PU16	0.17	2049.3	TT&C
IR01	0.042	1622.6125	TT&C
PU26	2.66	2049.3	TT&C
AIS1	0.025	161.975	Service Link
AIS2	0.025	162.025	Service Link
DSC	0.025	156.525	Service Link
HTU6	0.18	2053.0	TT&C
EPRB	0.1	406.05	Service Link
ADSB	4.6	1090.0	Service Link
AIS3	0.025	156.775	Service Link

Transmitting Beams 1:

Question	Response
Beam ID	ISL
Transmit Beam Frequency	1618.725 MHz -1626.5 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	4.5 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-40.7 dBW/Hz
Max. Transmit EIRP	5.54 dBW
Co- or Cross Polar Mode	C
Service Area Description	Global

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-142.7	-141.1	-139.6	-138.2	-137.0	-130.8

Transmitting Beams 2:

Question	Response
Beam ID	TCXD
Transmit Beam Frequency	8025.0 MHz -8400.0 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	7.0 dBi
Antenna Pointing Error	1.0 degrees
Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-54.0 dBW/Hz
Max. Transmit EIRP	0.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-154.1	-152.1	-150.4	-148.8	-147.5	-141.0

Transmitting Beams 3:

Question	Response
Beam ID	PAYD
Transmit Beam Frequency	8025.0 MHz -8400.0 MHz
Beam Type	Steerable
Polarization	RHCP
Peak Gain	13.0 dBi
Antenna Pointing Error	1.0 degrees

Antenna Rotational Error	1.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-57.1 dBW/Hz
Max. Transmit EIRP	11.9 dBW
Co- or Cross Polar Mode	C
Service Area Description	VISIBLE EARTH

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-157.2	-155.3	-153.5	-152.0	-150.6	-144.1

Transmitting Channels (9)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
IT01	0.042	1622.6125	TT&C
XD32	0.05	8297.0	TT&C
PD22	40.0	8165.0	Service Link
XD12	0.3	8297.0	TT&C
XD42	0.02	8297.0	TT&C
XD52	0.01	8297.0	TT&C
PD32	8.0	8165.0	Service Link
XD22	0.1	8297.0	TT&C
PD12	80.0	8165.0	Service Link

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2)(ii) and (iii), or 25.144(a)(3)(i), or 25.145(c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	N/A
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	Yes
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	N/A
Are the applicable full-frequency-reuse requirements of 25.210 met?	
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Description
USASAT-30G-1_FCC_GIMS - RevA.mdb		NGSO Antenna Gain Data	GIMS file (*.mdb)	Beam projections for all relevant beams