

**SATELLITE EARTH STATION AUTHORIZATIONS**  
**FCC Form 312 - Schedule B:(Technical and Operational Description)**  
**FOR OFFICIAL USE ONLY**

**Location of Earth Station Site**

|                               |                                                                                                                                                    |                   |            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------|
| E1: Site Identifier:          | NB-IoT NTN 1                                                                                                                                       | E5: Call Sign:    |            |
| E2: Contact Name:             | Steven Charles Hemple                                                                                                                              | E6: Phone Number: | 7694764812 |
| E3: Street:                   |                                                                                                                                                    | E7: City:         |            |
| E4: State:                    |                                                                                                                                                    | E8: County:       |            |
|                               |                                                                                                                                                    | E9: Zip Code:     |            |
| E10: Area of Operation:       | Continental United States, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands, all U.S. territories and possessions, and all U.S. territorial waters |                   |            |
| E11: Latitude:                | 0° 0' 0"                                                                                                                                           |                   |            |
| E12: Longitude:               | 0° 0' 0"                                                                                                                                           |                   |            |
| E13: Lat/Lon Coordinates are: |                                                                                                                                                    |                   |            |
| E14: Site Elevation (AMSL):   | 0                                                                                                                                                  |                   |            |

|                                                                                                                                                                                                                                                                                                                                                                            |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| If the proposed antenna(s) operate in the Fixed Satellite Service (FSS) with geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurement? If NO, provide a technical analysis showing compliance with two-degree spacing policy. | N/A |
| If the proposed antenna(s) do not operate in the Fixed Satellite Service (FSS) or if they operate in the Fixed Satellite Service (FSS) with non-geostationary satellites, do(es) the proposed antenna(s) comply with the antenna gain patterns specified in Section 25.209(a) and (b) as demonstrated by the manufacturer's qualification measurement?                     | N/A |
| Is Frequency Coordination required?                                                                                                                                                                                                                                                                                                                                        | No  |
| Is coordination with another country required?                                                                                                                                                                                                                                                                                                                             | No  |
| Is FAA notification required?                                                                                                                                                                                                                                                                                                                                              | No  |

|                                         |     |
|-----------------------------------------|-----|
| Is facility operated by remote control? | Yes |
|-----------------------------------------|-----|

## POINTS OF COMMUNICATION

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| Satellite Name: INMARSAT 4F3 (S2932) |                                     |
| E21. Common Name: INMARSAT 4F3       | E22. ITU Name: INMARSAT 4F3 (S2932) |
| E23. Orbit Location: -98             | E24. Country: GBR                   |

|                             |                          |
|-----------------------------|--------------------------|
| Satellite Name: ISAT List   |                          |
| E21. Common Name: ISAT List | E22. ITU Name: ISAT List |
| E23. Orbit Location: SYSTEM | E24. Country: USA        |

|                                |                                     |
|--------------------------------|-------------------------------------|
| Satellite Name: INMARSAT 3F5   |                                     |
| E21. Common Name: INMARSAT 3F5 | E22. ITU Name: INMARSAT 3F5 (S2949) |
| E23. Orbit Location: -54       | E24. Country: GBR                   |

|                                 |                                   |
|---------------------------------|-----------------------------------|
| Satellite Name: SKYTERRA 1      |                                   |
| E21. Common Name: SKYTERRA-1    | E22. ITU Name: SKYTERRA-1 (S2358) |
| E23. Orbit Location: 101.3 W.L. | E24. Country: USA                 |

## ANTENNA

| Site ID      | E28. Antenna Id | E29. Quantity | E30. Manufacturer | E31. Model | E32. Antenna Size (meters) | E41/42. Antenna Gain Transmit and/or Recieve (dBi at GHz) |
|--------------|-----------------|---------------|-------------------|------------|----------------------------|-----------------------------------------------------------|
| NB-IoT NTN 1 | NTN-CLASS-3     | 2000000       | Various           | Various    | 0                          | undefined at 0                                            |

| E28. Antenna Id | E33/34. Diameter Minor/Major (meters) | E35. Above Ground Level (meters) | E36. Above Sea Level (meters) | E37. Building Height Above Ground Level (meters) | E38. Total Input Power at Antenna Flange (Watts) | E39. Maximum Antenna Height Above Rooftop (meters) | E40. Total EIRP for all carriers (dBW) |
|-----------------|---------------------------------------|----------------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|----------------------------------------|
|-----------------|---------------------------------------|----------------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|----------------------------------------|

|             |     |   |   |   |     |   |   |
|-------------|-----|---|---|---|-----|---|---|
| NTN-CLASS-3 | 0/0 | 0 | 0 | 0 | 0.2 | 0 | 8 |
|-------------|-----|---|---|---|-----|---|---|

| Site ID      | E28. Antenna Id | E29. Quantity | E30. Manufacturer | E31. Model | E32. Antenna Size (meters) | E41/42. Antenna Gain Transmit and/or Recieve (dBi at GHz) |
|--------------|-----------------|---------------|-------------------|------------|----------------------------|-----------------------------------------------------------|
| NB-IoT NTN 1 | NTN-CLASS-1     | 2000000       | Various           | Various    | 0                          | undefined at 0                                            |

| E28. Antenna Id | E33/34. Diameter Minor/Major (meters) | E35. Above Ground Level (meters) | E36. Above Sea Level (meters) | E37. Building Height Above Ground Level (meters) | E38. Total Input Power at Antenna Flange (Watts) | E39. Maximum Antenna Height Above Rooftop (meters) | E40. Total EIRP for all carriers (dBW) |
|-----------------|---------------------------------------|----------------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|----------------------------------------|
| NTN-CLASS-1     | 0/0                                   | 0                                | 0                             | 0                                                | 0.2                                              | 0                                                  | -1.5                                   |

| Site ID      | E28. Antenna Id | E29. Quantity | E30. Manufacturer | E31. Model                | E32. Antenna Size (meters) | E41/42. Antenna Gain Transmit and/or Recieve (dBi at GHz) |
|--------------|-----------------|---------------|-------------------|---------------------------|----------------------------|-----------------------------------------------------------|
| NB-IoT NTN 1 | NTN-Patch-1     | 2000000       | Molex             | NTN L-band Patch 60x60 mm | 0.028                      | undefined at 0                                            |

| E28. Antenna Id | E33/34. Diameter Minor/Major (meters) | E35. Above Ground Level (meters) | E36. Above Sea Level (meters) | E37. Building Height Above Ground Level (meters) | E38. Total Input Power at Antenna Flange (Watts) | E39. Maximum Antenna Height Above Rooftop (meters) | E40. Total EIRP for all carriers (dBW) |
|-----------------|---------------------------------------|----------------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|----------------------------------------|
| NTN-Patch-1     | 0.05/0.05                             | 0                                | 0                             | 0                                                | 0.2                                              | 0                                                  | -2.5                                   |

| Site ID | E28. Antenna Id | E29. Quantity | E30. Manufacturer | E31. Model | E32. Antenna Size (meters) | E41/42. Antenna Gain Transmit and/or Recieve (dBi at GHz) |
|---------|-----------------|---------------|-------------------|------------|----------------------------|-----------------------------------------------------------|
|---------|-----------------|---------------|-------------------|------------|----------------------------|-----------------------------------------------------------|

|              |             |         |         |         |   |                |
|--------------|-------------|---------|---------|---------|---|----------------|
| NB-IoT NTN 1 | NTN-CLASS-2 | 2000000 | Various | Various | 0 | undefined at 0 |
|--------------|-------------|---------|---------|---------|---|----------------|

| E28. Antenna Id | E33/34. Diameter Minor/Major (meters) | E35. Above Ground Level (meters) | E36. Above Sea Level (meters) | E37. Building Height Above Ground Level (meters) | E38. Total Input Power at Antenna Flange (Watts) | E39. Maximum Antenna Height Above Rooftop (meters) | E40. Total EIRP for all carriers (dBW) |
|-----------------|---------------------------------------|----------------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|----------------------------------------|
| NTN-CLASS-2     | 0/0                                   | 0                                | 0                             | 0                                                | 0.2                                              | 0                                                  | 3                                      |

| Site ID      | E28. Antenna Id | E29. Quantity | E30. Manufacturer | E31. Model | E32. Antenna Size (meters) | E41/42. Antenna Gain Transmit and/or Recieve (dBi at GHz) |
|--------------|-----------------|---------------|-------------------|------------|----------------------------|-----------------------------------------------------------|
| NB-IoT NTN 1 | NTN-PEANLP-1    | 2000000       | Molex             | PEANLP1012 | 0.275                      | undefined at 0                                            |

| E28. Antenna Id | E33/34. Diameter Minor/Major (meters) | E35. Above Ground Level (meters) | E36. Above Sea Level (meters) | E37. Building Height Above Ground Level (meters) | E38. Total Input Power at Antenna Flange (Watts) | E39. Maximum Antenna Height Above Rooftop (meters) | E40. Total EIRP for all carriers (dBW) |
|-----------------|---------------------------------------|----------------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|----------------------------------------|
| NTN-PEANLP-1    | 0/0                                   | 0                                | 0                             | 0                                                | 0.2                                              | 0                                                  | 4                                      |

| Site ID      | E28. Antenna Id | E29. Quantity | E30. Manufacturer | E31. Model                  | E32. Antenna Size (meters) | E41/42. Antenna Gain Transmit and/or Recieve (dBi at GHz) |
|--------------|-----------------|---------------|-------------------|-----------------------------|----------------------------|-----------------------------------------------------------|
| NB-IoT NTN 1 | NTN-Patch-2     | 2000000       | Molex             | NTN L-band Patch 106x106 mm | 0.051                      | undefined at 0                                            |

| E28. Antenna | E33/34. Diameter | E35. Above | E36. Above | E37. Building | E38. Total | E39. Maximum | E40. Total |
|--------------|------------------|------------|------------|---------------|------------|--------------|------------|
|--------------|------------------|------------|------------|---------------|------------|--------------|------------|

| <b>Id</b>   | <b>Minor/Major (meters)</b> | <b>Ground Level (meters)</b> | <b>Sea Level (meters)</b> | <b>Height Above Ground Level (meters)</b> | <b>Input Power at Antenna Flange (Watts)</b> | <b>Antenna Height Above Rooftop (meters)</b> | <b>EIRP for all carriers (dBW)</b> |
|-------------|-----------------------------|------------------------------|---------------------------|-------------------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------|
| NTN-Patch-2 | 0.09/0.09                   | 0                            | 0                         | 0                                         | 0.2                                          | 0                                            | -2                                 |

## FREQUENCY

| <b>E28. Antenna Id</b> | <b>E43/44. Frequency Bands (MHz)</b> | <b>E45. T/R Mode</b> | <b>E46. Antenna Polarization (H,V,L,R)</b> | <b>E47. Emission Designator</b> | <b>E48. Maximum EIRP per Carrier (dBW)</b> | <b>E49. Maximum ERIP Density per Carrier (dBW/4kHz)</b> |
|------------------------|--------------------------------------|----------------------|--------------------------------------------|---------------------------------|--------------------------------------------|---------------------------------------------------------|
| NTN-Patch-2            | 1525<br>1559                         | R                    | null                                       | 15K0G1D                         | 0                                          | 0                                                       |

### E50. Modulation and Services

QPSK/16QAM NPDSCH

| <b>E28. Antenna Id</b> | <b>E43/44. Frequency Bands (MHz)</b> | <b>E45. T/R Mode</b> | <b>E46. Antenna Polarization (H,V,L,R)</b> | <b>E47. Emission Designator</b> | <b>E48. Maximum EIRP per Carrier (dBW)</b> | <b>E49. Maximum ERIP Density per Carrier (dBW/4kHz)</b> |
|------------------------|--------------------------------------|----------------------|--------------------------------------------|---------------------------------|--------------------------------------------|---------------------------------------------------------|
| NTN-PEANLP-1           | 1626.5<br>1660.5                     | T                    | null                                       | 3K75G1D                         | 4                                          | 4                                                       |

### E50. Modulation and Services

$\pi/2$ -BPSK NPUSCH NB-NTN IoT

| <b>E28. Antenna Id</b> | <b>E43/44. Frequency Bands (MHz)</b> | <b>E45. T/R Mode</b> | <b>E46. Antenna Polarization (H,V,L,R)</b> | <b>E47. Emission Designator</b> | <b>E48. Maximum EIRP per Carrier (dBW)</b> | <b>E49. Maximum ERIP Density per Carrier (dBW/4kHz)</b> |
|------------------------|--------------------------------------|----------------------|--------------------------------------------|---------------------------------|--------------------------------------------|---------------------------------------------------------|
| NTN-CLASS-1            | 1525<br>1559                         | R                    | null                                       | 15K0G1D                         | 0                                          | 0                                                       |

### E50. Modulation and Services

QPSK/16QAM NPDSCH

| E28. Antenna Id | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum EIRP Density per Carrier (dBW/4kHz) |
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-CLASS-2     | 1626.5<br>1660.5              | T             | null                                | 3K75G1D                  | 3                                   | 3                                                |

#### E50. Modulation and Services

$\pi/2$ -BPSK NPUSCH NB-NTN IoT

| E28. Antenna Id | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum EIRP Density per Carrier (dBW/4kHz) |
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-CLASS-2     | 1525<br>1559                  | R             | null                                | 15K0G1D                  | 0                                   | 0                                                |

#### E50. Modulation and Services

QPSK/16QAM NPDSCH

| E28. Antenna Id | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum EIRP Density per Carrier (dBW/4kHz) |
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-CLASS-3     | 1525<br>1559                  | R             | null                                | 15K0G1D                  | 0                                   | 0                                                |

#### E50. Modulation and Services

QPSK/16QAM NPDSCH

| E28. Antenna Id | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum EIRP Density per Carrier (dBW/4kHz) |
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|

|                      |              |   |      |         |   |   |
|----------------------|--------------|---|------|---------|---|---|
| NTN-<br>PEANLP-<br>1 | 1525<br>1559 | R | null | 15K0G1D | 0 | 0 |
|----------------------|--------------|---|------|---------|---|---|

**E50. Modulation and Services**

QPSK/16QAM NPDSCH

| E28. Antenna Id                     | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum ERIP Density per Carrier (dBW/4kHz) |
|-------------------------------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-Patch-2                         | 1626.5<br>1660.5              | T             | null                                | 3K75G1D                  | -3                                  | -3                                               |
| <b>E50. Modulation and Services</b> |                               |               |                                     |                          |                                     |                                                  |
| $\pi/2$ -BPSK NPUSCH NB-NTN IoT     |                               |               |                                     |                          |                                     |                                                  |

| E28. Antenna Id                                                                                    | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum ERIP Density per Carrier (dBW/4kHz) |
|----------------------------------------------------------------------------------------------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-Patch-1                                                                                        | 1626.5<br>1660.5              | T             | null                                | 3K75G1D                  | -2.5                                | -2.5                                             |
| <b>E50. Modulation and Services</b> <div> <math>\pi/2</math>-BPSK NPUSCH NB-NTN IoT         </div> |                               |               |                                     |                          |                                     |                                                  |

| E28. Antenna Id                                                  | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum ERIP Density per Carrier (dBW/4kHz) |
|------------------------------------------------------------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-Patch-1                                                      | 1525<br>1559                  | R             | null                                | 15K0G1D                  | 0                                   | 0                                                |
| <b>E50. Modulation and Services</b> <div>QPSK/16QAM NPDSCH</div> |                               |               |                                     |                          |                                     |                                                  |

| E28. Antenna Id | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum ERIP Density per Carrier (dBW/4kHz) |
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-CLASS-1     | 1626.5<br>1660.5              | T             | null                                | 3K75G1D                  | -1.5                                | -1.5                                             |

#### E50. Modulation and Services

$\pi/2$ -BPSK NPUSCH NB-NTN IoT

| E28. Antenna Id | E43/44. Frequency Bands (MHz) | E45. T/R Mode | E46. Antenna Polarization (H,V,L,R) | E47. Emission Designator | E48. Maximum EIRP per Carrier (dBW) | E49. Maximum ERIP Density per Carrier (dBW/4kHz) |
|-----------------|-------------------------------|---------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------|
| NTN-CLASS-3     | 1626.5<br>1660.5              | T             | null                                | 3K75G1D                  | 8                                   | 8                                                |

#### E50. Modulation and Services

$\pi/2$ -BPSK NPUSCH NB-NTN IoT

### FREQUENCY COORDINATION

| E28. Antenna Id | E51. Satellite Orbit Type | E52/53. Frequency Limits(MHz) | E54/55. Range of Satellite Arc E/W Limit | E56. Earth Station Azimuth Angle Eastern/Western Limit | E57. Antenna Elevation Angle Eastern/Western Limit | E60. Maximum EIRP Density toward the Horizon (dBW/4kHz) |
|-----------------|---------------------------|-------------------------------|------------------------------------------|--------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------|
| NTN-Patch-1     | Geostationary             | 1525<br>1559                  | 180 /<br>180                             | 90 / 270                                               | 3 / 3                                              | -999                                                    |

NTN-Patch-2Geostationary1626.5

1660.5180 / 18090 / 2703 / 3-2.7NTN-Patch-2Geostationary1525

1559180 / 18090 / 2703 / 3-999NTN-Patch-1Geostationary1626.5

1660.5180 / 18090 / 2703 / 3-2.2NTN-PEANLP-1Geostationary1626.5

1660.5180 / 18090 / 2703 / 34.28NTN-PEANLP-1Geostationary1525

1559180 / 18090 / 2703 / 3-999NTN-CLASS-3Geostationary1626.5

1660.5180 / 18090 / 2703 / 38NTN-CLASS-3Geostationary1525

1559180 / 18090 / 2703 / 3-999NTN-CLASS-1Geostationary1626.5

1660.5180 / 18090 / 2703 / 3-1.2NTN-CLASS-1Geostationary1525

1559180 / 18090 / 2703 / 3-999NTN-CLASS-2Geostationary1626.5

1660.5180 / 18090 / 2703 / 3-1.2NTN-CLASS-2Geostationary1525

1559180 / 18090 / 2703 / 3-999

**REMOTE CONTROL POINT LOCATION**

|                      |              |                                                     |                |
|----------------------|--------------|-----------------------------------------------------|----------------|
| E61. Call Sign:      |              | E65. Phone Number:<br><br>321-308-0112              |                |
| E62. Street Address: |              |                                                     |                |
| E63. City:           | E67. County: | E64/68. State/Country:<br><br>undefined / undefined | E66. Zip Code: |

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