Exhibit B – Technical Annex

1. Scope

This exhibit describes the Internet of Things (IoT) payload on board the Yet Another Mission 2 (YAM-2) non-geostationary satellite orbit (NGSO) satellite, as required by Section 25.114 and other sections of the Part 25 rules that cannot be entered into the Schedule S online submission system.[1]

2. General Description (Section 25.114(d)(1))

The IoT payload will transmit in the 400.05-400.15 MHz band and receive in the 864-925 MHz band.[2]

- TX – Beacon
  - 400.05 – 400.15 MHz (programmable in this range)
  - 20% TX Duty cycle within 5s frame
  - Turnstile antenna
  - 1.1 dBi antenna gain
  - 5 dBW EIRP
- RX – Data Collection
  - Channels
    - CH1: 865.7 MHz – 1.4 MHz bandwidth
    - CH2: 868.85 MHz – 1.7 MHz bandwidth
    - CH3: 904.0 MHz – 4.0 MHz bandwidth
    - CH4: 922.0 MHz – 4.0 MHz bandwidth
  - Patch RX Antenna (low gain)
    - 80-degree half power beamwidth
    - 6.7 dBi peak gain
  - Patch Array RX Antenna (high gain)
    - 40-degree half power beamwidth
    - 10.5 dBi peak gain

3. Frequency Plan

The following table lists the UHF space-to-Earth beacon channels planned for the IoT payload. The UHF beacon operates at 400.1 MHz with a bandwidth of 1 kHz, 12 kHz, or 50 kHz depending upon operational mode. The UHF beacon signal is a programmable I/Q sampled waveform that lasts for 1s and is transmitted every 5s.

Table 1 UHF Beacon Signal Space-to-Earth Transmit Frequency Plan

Channel ID	Bandwidth (MHz)	Center Frequency (MHz)	Polarization
ET11	0.001	400.1	RHCP
ET21	0.012	400.1	RHCP
ET31	0.05	400.1	RHCP

[1] *See* Application of Loft Orbital, File No. SAT-LOA-20190807-00072 (filed Aug. 7, 2019).
[2] This payload will operate pursuant to the International Telecommunication Union (ITU) filing F-SAT-NG-8 and will also be separately licensed by the French administration. *See* Narrative at 1-2.

The following table lists the UHF Earth-to-space IoT receive channels planned for the YAM-2 satellite. The received UHF IoT signals are in the 864-925 MHz band. The payload digitizes the channels listed in Table 2 and stores the digitized data into memory for subsequent data processing.

Table 2 UHF Data Collection Earth-to-Space Receive Frequency Plan

Channel ID	Bandwidth (MHz)	Center Frequency (MHz)	Polarization
ER1	1.4	865.7	RHCP
ER2	1.7	868.85	RHCP
ER3	4.0	904.0	RHCP
ER4	4.0	922.0	RHCP

4. ITU Filings

The YAM-2 satellite constellation is associated with the USASAT-30J ITU filing, which has been submitted with this Part 25 FCC filing.[3] The IoT payload (operating in the 400.05-400.15 MHz band) will be operated under an ITU filing submitted by the French Administration.[4]

5. Link Budgets

No link budget analysis is provided for the signal transmitted in the 400.05-400.15 MHz band or the reception of the 864-925 MHz band because such analysis would not be meaningful in the context of those transmissions.

6. Satellite Antennas

The antenna pattern for the transmission of the UHF programmable beacon waveform to the IoT terminals is illustrated in Figure 1. The UHF beacon transmit beam is Zenith pointing and has a maximum gain of 1.1 dBi with a near omni-direction pattern.

The wide-beam and narrow-beam antenna patterns for the reception of the UHF waveforms from the IoT terminals is illustrated in Figure 2 and Figure 3 for the wide-beam antenna pattern and Figure 4 and Figure 5 for the narrow-beam antenna pattern. The UHF receive beams are Zenith pointing and have a maximum gain of 10.5 dBi for the narrow-beam and 6.7 dBi for the wide-beam near omni-direction pattern.

The antenna projections provided in the accompanying Schedule S reflect the beam projection towards Nadir from a NGSO satellite with an orbital altitude of 550 km. Due to limitations in the ITU GIMS software, the beam projections provided are GSO footprints. This approach was taken in order to provide actual GXT contours rather than just images of projected contours which is the only available option for NGSO systems.

[3] Concurrent to this filing, Loft Orbital is submitting a modified ITU filing to include the 864-925 MHz band.
[4] *See supra* note 2.

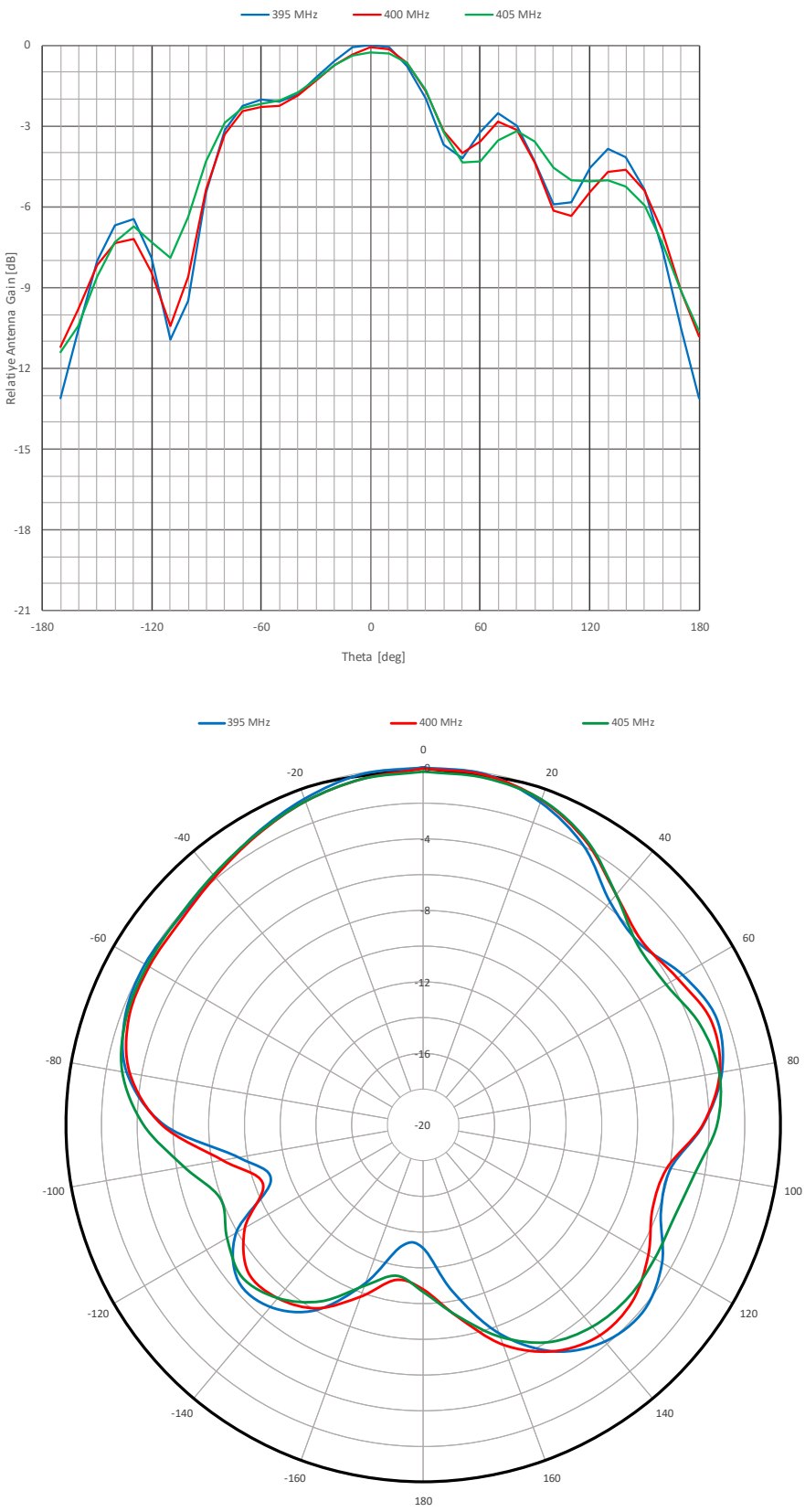

Figure 1 UHF Beacon (ETXL) - Transmit Antenna Pattern

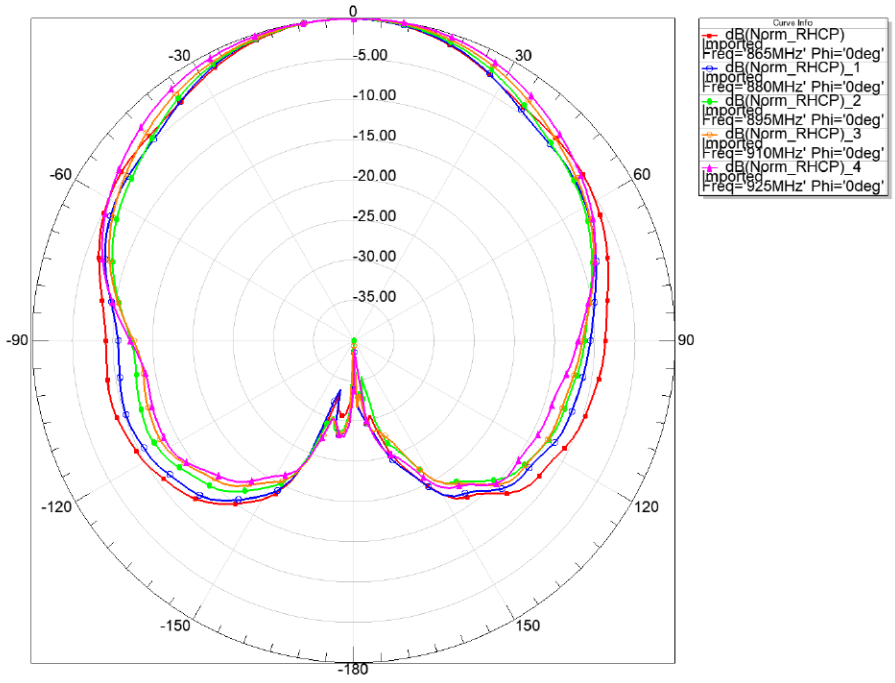

Figure 2 UHF Wide-Beam (ERXL) - Receive Antenna Pattern – 0-deg Cut

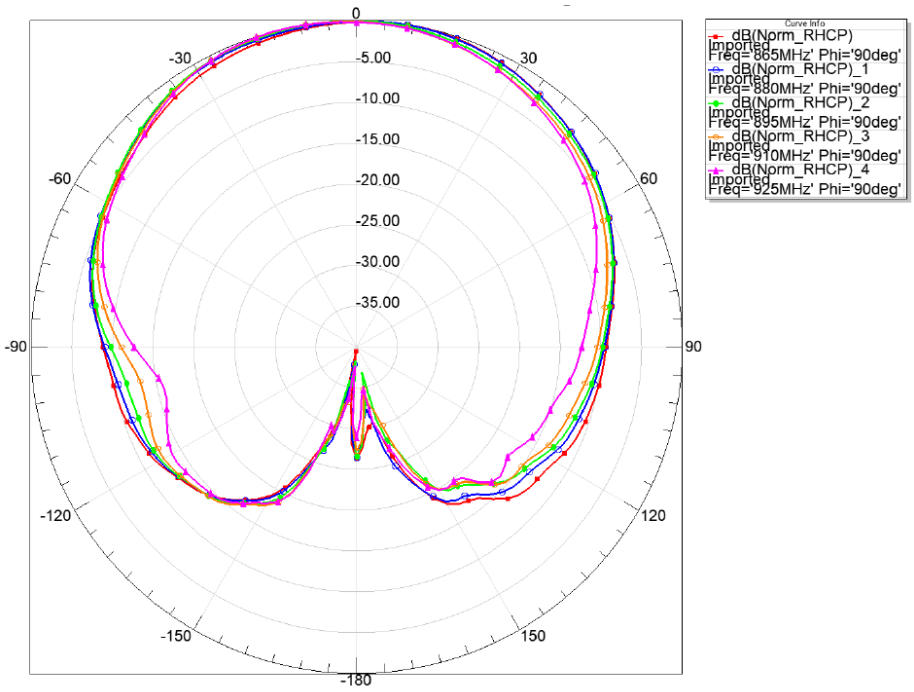

Figure 3 UHF Wide-Beam (ERXL) - Receive Antenna Pattern – 90-deg Cut

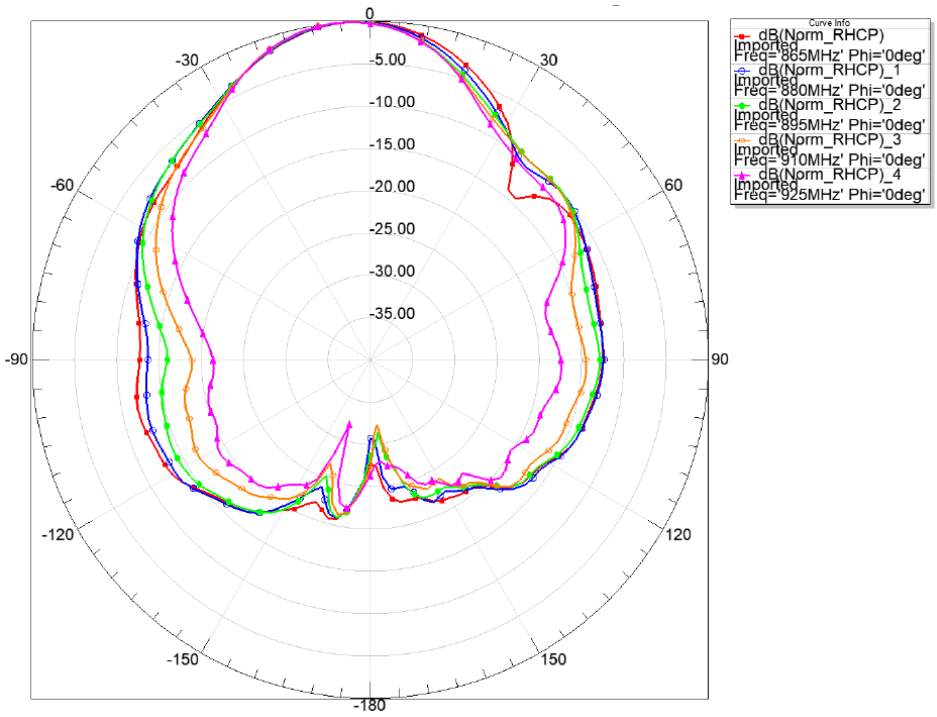

Figure 4 UHF Narrow-Beam (ERXH) - Receive Antenna Pattern – 0-deg Cut

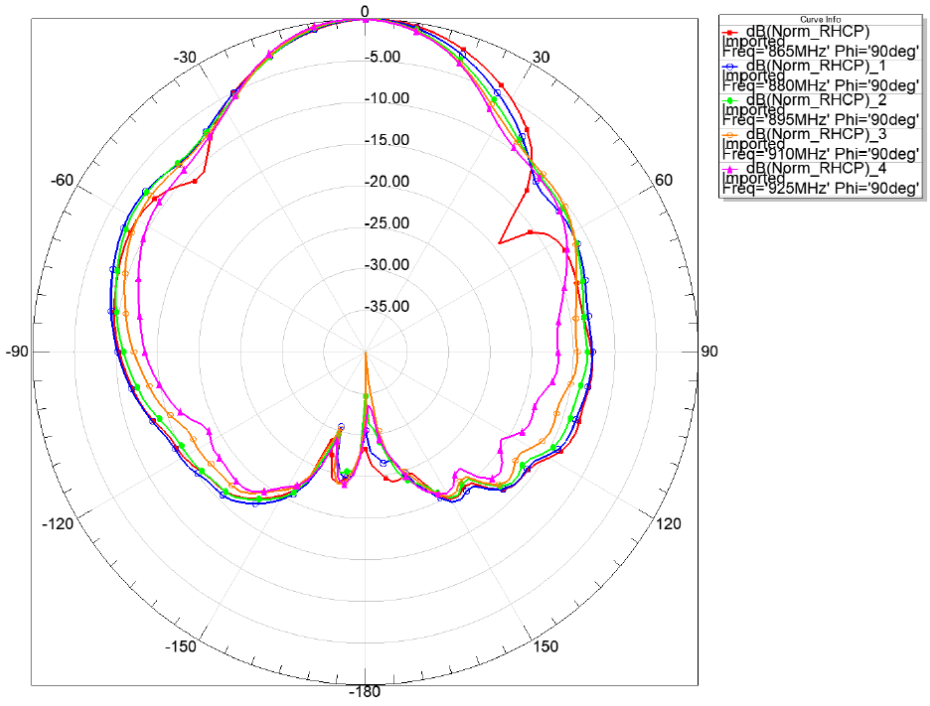

Figure 5 UHF Narrow-Beam (ERXH) - Receive Antenna Pattern – 90-deg Cut

7. Orbital Debris Risk Mitigation Plan

Loft Orbital's detailed Orbital Debris Assessment Report is attached as Exhibit C.[5]

[5] *See* 47 C.F.R. § 25.114(d)(14)(iv).

CERTIFICATION OF PERSON RESPONSIBLE FOR PREPARING ENGINEERING INFORMATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in this application, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this application, and that it is complete and accurate to the best of my knowledge and belief.

/s/

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